The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXVII, No. 11 CHICAGO, ILLINOIS SEPTEMBER 9, 1916

REMOVAL OF THE RIGHT COLON: INDICATIONS AND TECHNIC*

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For many years the indications for the surgical treatment of megacolon, tumors, fistulas and some diseases of the colon have been definite. The principles involved and the technic employed have been carefully considered along lines of theoretical, experimental and practical development. The results of cure or relief within the natural limitations of the character and the extent of the diseases have been excellent. Within a few years still greater progress has been made in our knowledge of diseases of the colon, largely because of the endeavor to treat surgically not only stasis as an entity, but also various acute and chronic diseases, general and local, resulting from it, or, when other cause is not apparent, presumed to result from it. Thus, in chronic changes in the circulation, such as endarteritis, in the nervous system, such as in epilepsy and neurasthenia, in muscle degeneration, rheumatoid arthritis, enteroptosis and various chronic so-called toxic diseases, surgical treatment by removal or short-circuiting the bowel was along lines already developed for the removal of tumors or the treatment of obstruction.

These theories have been developed mainly by the work of Lane,[1] who in short-circuiting and removing the colon made practical application of the view of Metchnikoff, namely, that the bacterial flora of the colon is responsible for many of the chronic ills of man, and that if it were possible to eliminate or shorten the colon, these ills would be decreased. There is just enough truth in this theory and sufficient that is not true to require years to standardize the diseases and conditions between the border lines of medicine and surgery, in which the elimination of the colon will give sufficient improvement over the results of therapeusis to justify such surgical intervention. This period will be reached only when the collective judgment of the profession can select the proper cases. While Lane may be overenthusiastic in his claims, he deserves credit for much of the knowledge of the physiology and disease of the colon possessed by the medical profession today. There is no controversy concerning operations for tumors and for obstructions.

Fig. 1.—Removal of right colon, showing lines of section.

In properly selected cases of constipation, great benefit can often be obtained by the surgical elimination of the absorbing

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Lane, W. A.: Chronic Intestinal Stasis, Brit. Med. Jour., 1912, i, 989; Surg., Gynec. and Obst., 1910, xi, 495; Lancet, London, 1912, ii, 1706.

area of the colon. It is certainly not advisable for simple constipation, but is advisable for some selected severe cases in which the patients are disabled by the condition in spite of prolonged and varied treatment. At the present time the patients considered suitable subjects for this procedure are those who are toxic from the condition, the drugs or the absorption of unpassed intestinal contents after taking physic, and in whom the Roentgen ray shows a stasis of from three to four days' duration, which is often associated with complicating chronic infections.

We have performed general colectomy in a few cases, and the right or partial colectomy in a larger number, and we believe that except in cases in which there are tumors and local disease, the latter operation is as good for the relief of symptoms as the general colectomy. First, it removes the greatest absorbent surface in the colon; second, it is not so severe an operation, and third, it preserves the omentum, the loss of which is a serious consideration in itself, reducing protection, warmth, mobility, and the equalization of the abdominal circulation. The general colectomy often leads to matting adhesions of the anterior layers of the intestine. In some cases, as reported by Clark,[2] these adhesions cause serious disability and in many cases require further operation and occasionally result in death.

It is true that much of the present-day surgery has been taken from fields formerly classified from the therapeutic standpoint as medical, and in the slow process of change the surgeon has been held in check by a constant dispute of the ground. Specialists have been developed to treat the stomach, the first portion of the intestine and the upper abdomen, and others who devote their attention to the lower end of the colon and pelvis. Thus it is that several yards of bowel have been left as an unclaimed field—not only unclaimed, but not wanted—and this has been forced on the surgeon for the relief of numerous chronic ailments, many of which are incurable.

In judging the probable or possible benefits of the surgery of necessity or expediency, the development and function of the large bowel should be taken into consideration.

Like the stomach and urinary bladder, the colon has a shorter heredity than the small intestine. Originally it was equipped on its right side with absorbing villi like those of the small intestine, which disappeared early. The first portion of the colon is an absorber of fluids which are taken through the portal circulation, while the left half of the colon, especially its lower portion, has become, through convenience, an organ for the storage of the drier fecal matter. It is the natural habitat of several microbes, the activities of which produce a considerable part of its fecal contents. Such bacteria are harbored throughout life; consequently, a considerable degree of immunity to them is natural to the individual even when they become misplaced. Several diseases chronic in character, local and general, are caused by varieties of intestinal bacteria and protozoa which are not sufficiently common for the development of immunity.

The lymphatics of the colon are limited in comparison with those of the small intestine, which are very numerous. Reasoning from the nature of the contents of the colon, the converse would appear to be true; but as I have pointed out,[3] it is probable that the lymphatic supply was limited so that the septic colonic contents might be passed through the liver. This provision of nature explains why malignant diseases of the colon remain localized for such long periods as compared with malignant diseases of the small intestine. Butlin[4] shows that in about 50 per cent. of patients with malignancy of the colon, the disease at death is still local. In young persons, however, the lymphatics are more active, and earlier distribution of the disease is evident. This is true also of cancers located in the transverse colon with its associated omental glands.

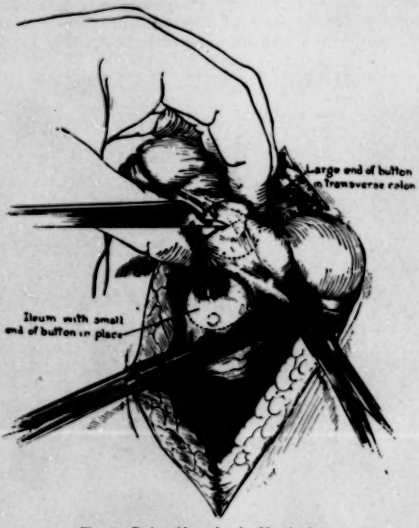

Fig. 2.—End-to-side union by Murphy button.

The entrance of the small bowel into the colon is closed by the ileocecal valve, which is rather badly constructed mechanically and often ineffective. By one series of observers, it is looked on as acting to delay the passage of the contents of the ileum until further time is given for absorption of nutriment. Simple constipation has been relieved by enlarging the ileocecal valve (W. J. Mayo).[5] Others believe the valve acts to prevent the entrance of gas and bacterial products from the colon to the ileum, whose absorbing villi do not have the liver for a purifying agent, and some surgeons operate to reconstruct the valve (Kellogg).[6] Symington's[7] description of the valve shows that its inefficiency is due largely to the obliquity of its entrance into the cecum; also to its lower attachment to the inner cecal wall and partial invagination into the cavity of the large bowel. In this respect it forms a mechanical barrier against back-flow such as

2. Clark, J. G.: The Removal of the Colon for Obstructive Fecal Stasis, with a Report of Eight Cases, Tr. South. Surg. and Gynec. Assn., 1913, xxvi, 358.

3. Mayo, C. H.: Surgical Physiology of the Lymphatic System, Tr. South. Surg. and Gynec. Assn., 1903, xvi, 442.

4. Butlin, H. T.: On the Operative Surgery of Malignant Disease, Philadelphia, P. Blakiston's Son & Co., 1900, p. 260.

5. Mayo, W. J.: Ileocecal Orifice and Its Bearing on Chronic Constipation, Ann. Surg., 1900, xxxii, 364.

6. Kellogg, J. H.: Incompetency of the Ileocecal Valve the Most Common Cause of Ileal Stasis, Lancet-Clinic, 1915, cxiii, 602.

7. Symington, cited in Cunningham, D. J.: Text-Book of Anatomy, New York, William Wood & Co., 1907, p. 1078.

is formed by the mechanism of the common-duct entrance into the duodenum and the entrance of the ureter into the bladder. The viscus under tension compresses the duct entrance and requires at all times some muscular effort at delivery of its contents. Peristalsis of the intestine is stimulated by the intestinal content and varies with its variety or irritating qualities. In the small intestine it is fairly regular and constant until the bowel is emptied. This propelling effort is accomplished by the action of the circular and longitudinal intestinal muscles. The peristalsis of the colon differs from the peristalsis of the small intestine in that it is not constant; the fluid contents of the ileum passing into the cecum remain at rest for a considerable period of time until consistency is increased by the absorption of fluid. Metchnikoff is undoubtedly right in his claim that in health a great portion of the body fluids are absorbed from the large bowel. The cecum normally empties but a few times in twenty-four hours. In the large bowel these movements are usually accompanied by an audible gurgling. In the right colon a slight reverse peristalsis has been demonstrated which favors delay. Delay in the right colon is due to the attachment at the splenic flexure, which forms a simple kink-valve or bend in the tube. This must be of importance as it is the most constant attachment of the colon. Rising nearly as high as the entrance to the stomach, it prevents siphonage. The fact that the intestine is a muscular tube within a muscle-walled cavity makes all operations which depend for drainage on gravity ineffectual in the majority of instances. Peristalsis of the colon is also stimulated by the intestinal contents, the movement of which is caused by contraction of the circular fibers for steadying and pushing, and aided by the sacculations. The latter are formed by the three muscular ribbons, which are one-sixth shorter than the total length of the large bowel. In the forward movement of the thicker intestinal contents, the muscular ribbons serve as tractors. Space is made for the advance by the distention of the intestinal walls by the gas normally present. Thus a cecal sigmoidostomy will drain if the obstruction is above the cecum. Without obstruction, it may make a vicious circle. For various reasons the operation has been unpopular. A few patients, however, have been reported as benefited by it.

It has been shown that there is a wide variation in the length and size of the intestine in different persons; the shortest intestine on record was 8 feet long, and the longest, 33 feet (Lynch and Draper[8]). We thus have the extreme carnivorous type and the herbivorous type. While all of the colon can be sacrificed with the maintenance of approximate good health, the loss of more than one half of the small intestine is most serious.

The large bowel originates on the left side of the abdomen, the cecum rotating around the abdomen from left to right. At about the third month it is beneath the stomach and later rests beneath the liver and over the right kidney, until shortly before birth, when it descends to its final position in the right iliac fossa. Occasionally, according to Treves,[9] this descent may be delayed up to two years after birth, and rarely the rotation may not occur or the cecum may be permanently fixed over the right kidney. According to the period of descent it may ride over the top of the parietal peritoneum, developing a long mesentery, the "cecum mobile" of Wilms, or it may burrow through it, covering itself with an extra layer of peritoneum. Between these two extremes and the normal are the various forms of veils, adhesions and fixations as supporting ligaments described by Long,[10] Jackson,[11] Pilcher,[12] Gerster,[13] Gray,[14] Pringle,[15] Binnie,[16] Eastman,[17] Flint,[18] and Lane. It is at once evident that, because of the rota-

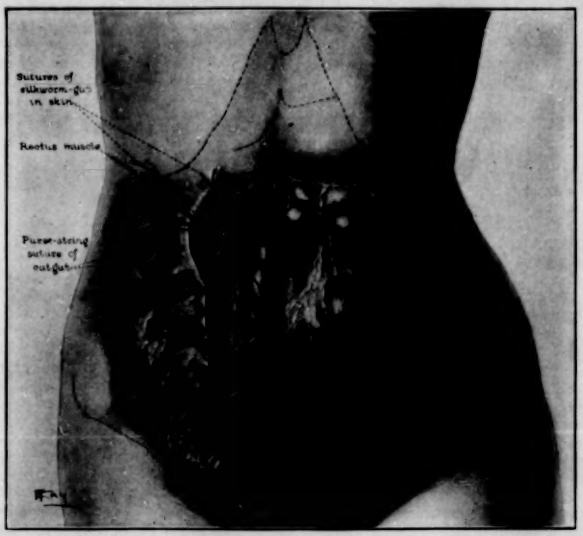

Fig. 3.—Incision, showing method of closure and end of bowel in depth of wound.

8. Lynch, J. M., and Draper, J. W.: Anastalsis and the Surgical Therapy of the Colon, Am. Jour. Med. Sc., 1914, cxlviii, 828.

9. Treves, F.: The Anatomy of the Intestinal Canal and Peritoneum, Hunterian Lectures, Brit. Med. Jour., 1885, i, 415, 470, 527, 580.

10. Long, J. W.: Pseudoperitoneal Cauls of the Colon, South. Surg. and Gynec. Assn., 1912, xxv, 446.

11. Jackson, J. N.: Membranous Pericolitis, Tr. West. Surg. and Gynec. Assn., 1908, xviii, 269.

12. Pilcher, L. S.: Surgical Aspects of Membranous Pericolitis, Ann. Surg., 1912, lv, 1.

13. Gerster, A. G.: On Chronic Colitis and Pericolitis, Ann. Surg., 1911, liv, 325.

14. Gray, H. M. W.: Chronic Intestinal Stasis, Brit. Med. Jour., 1914, i, 188.

15. Pringle, S. S.: Chronic Intestinal Stasis, Brit. Med. Jour., 1914, i, 183.

16. Binnie, J. F.: Pericolitis Dextra, Month. Cycl. Prac. Med., 1905, xviii, 341.

17. Eastman, J. R.: The Foetal Peritoneal Folds of Jonnesco, Treves and Reid and Their Probable Relationship to Jackson's Membrane and Lane's Kink, Surg., Gynec. and Obst., 1913, xvi, 341; A Further Study of Pericolonic Membranes, ibid., 1914, xviii, 228.

18. Flint, J. M.: Embryonic Bands and Membranes About the Caecum, Johns Hopkins Hosp. Bull., 1912, xxjii, 302.

tion, all vessels and nerves of any importance are to be found on the inner leaf of the mesentery, the outer fold being principally fixative. Division of the latter adds greatly to the mobility of the bowel without impairing its vitality and simplifies some operations on it.

In the development of the intestine the vitelline duct (or should a remnant be left, a Meckel diverticulum) is attached to the ileum about 2¾ feet from the ileocecal valve (Cunningham). Embryologically, then, the lower ileum is developed with the colon.

It is to be noted that in those operations in which the colon is removed—for example, Lane's operation—or in which in certain diseases it is rendered completely functionless for considerable periods by means of a low ileostomy as advocated by Brown,[19] the lower ileum becomes dilated and takes the place of the colon. Clark shows the dilatation of the ileum to be regular following colectomy. In low ileostomy the fluid contents of the ileum soon thicken, and emptying occurs at intervals with less gas and little odor.

TECHNIC

In operating on the right colon an incision is made in line with and through the right rectus. It should be ample in length to give free working space. Following a cursory examination of the right colon, a general exploration of the entire abdomen should be made to search for metastases in malignancy and also to avoid overlooking associated disease, thus preventing useless or unnecessarily extensive operations in malignancy or failing to make them sufficiently extensive.

If extirpation is decided on, extensive protective gauze packing is adjusted to the inner side of the colon. An incision is made along the white fold of parietal peritoneum where it joins the peritoneal covering of the outer side of the colon. This permits of extreme mobility and allows the bowel to be elevated outside of the abdominal incision. The space to the outer side is filled with a protective gauze pack. The ileac mesentery is perforated, and the ileum is divided between double clamps 3 inches from the ileocecal valve, the cut ends projecting from the forceps being sterilized with the actual cautery. From below up, the mesentery of the cecum and ascending colon is divided between forceps up to the transverse colon, and the omentum is ligated and separated from the right one third of the transverse colon (Fig. 1). At this point the colon is divided between clamps, the loose bowel removed, the projecting stump from the distal clamp also being treated by cautery. The vessels supplying this region, few in number and readily seen, are ligated with catgut. In nonmalignant cases the division of the mesentery is made closer to the bowel, while in malignancy more of the mesentery is taken, including the lymph glands which drain the area. Care should be taken in the separation of the colon to avoid injury to the duodenum. While the ureter should be observed on the right side, it does not come into the operative field except in extensive malignancy when ligation of the ureter or removal of the kidney may be necessary. We have been able to remove such advanced tumor growths in numerous instances, including several in which the patients had been explored and declared inoperable from one to several months previously. In the latter type of cases the tumors are usually adherent to the incision in the abdominal wall and require a block removal of the entire area over the growth. In such cases there is greater danger of recurrence in the abdominal muscles than of recurrence within the abdomen.

Using chromic catgut as a suture, the end of the colon is prepared for closing by inserting the needle and catching into the bowel first on one side and then the other over the forceps, including the peritoneum and muscle, the loops crossing the forceps being left loose. Any contents of the bowel are now forced onward, and a rubber-covered clamp applied for control about 4 inches from the end. The forceps closing the end of the bowel are now removed, the end opened and the female or spring side of a proper-size Murphy button pushed through the loose sutures into the opening and left loose within the colon (Fig. 2). The two ends of the thread being drawn taut, immediately invert the mucous end of the colon and approximate the peritoneal surfaces. A second row of sutures is applied to make the closure more perfect, the ends of the suture being left long. (Ligation of bowel end and purse-string invagination is equally good.) The button within the bowel is manipulated so that its tube is pressed against one of the muscular bands, about 2½ inches from the end of the bowel. The bowel is incised on the tube of the button, so that it can be pushed through the wall of the intestine, no suture being used. This is held until the other half of the button is adjusted into the end of the ileum by suture. The two halves are then pushed together, making an end-to-side union. If deemed necessary, a few interrupted sutures of fine catgut or silk may be used over the button, to adjust adjacent epiploic tags or omentum for protection and support at the point of union. The anastomosis can be made by suture, but the Murphy button is safer, quickly adjusted and ideal for the purpose. Some prefer side-to-side union in spite of the tendency to dilation of the blind ends. The triangular opening in the mesentery beneath the union is now closed by catgut suture. A few sutures are inserted to adjust the parietal peritoneum over the exposed cellular tissue from which the colon was separated (Fig. 3). The wound is now closed, the end of the colon being drawn into the peritoneal opening as closure is made. The

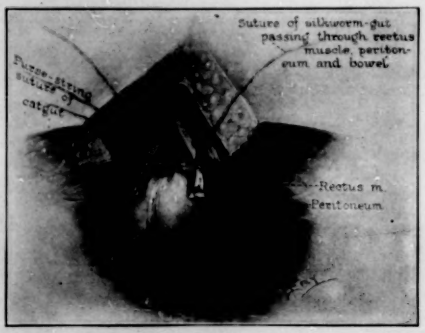
Suture of silkworm-gut passing through rectus muscle, peritoneum and bowel
Purse-string suture of catgut
Rectus m.
Peritoneum

Fig. 4.—End of colon brought up to peritoneum and sutured.

19. Brown, J. Y.: The Value of Complete Physiological Rest of the Large Bowel in the Treatment of Certain Ulcerative and Obstructive Lesions of this Organ, with Description of Operative Technique and Report of Cases, Tr. South. Surg. and Gynec. Soc., 1912, xxv, 440.

colon is brought into the muscle but not through it, the muscles being sutured above and below this point; the long suture from the end of the bowel hangs out of the incision. A strip of gauze is inserted to the end of the bowel to keep the muscles apart. The procedure is employed as a safety valve to relieve gas should stasis with great distention occur between the fourth and sixth days. Peritonitis causes most of the deaths by necrosis of the union from distention. In a series of twenty cases we have had no deaths from the use of the Murphy button and the safety-valve method. By drawing on the projecting suture and using small pointed forceps along the taut thread, the bowel is readily opened and gases permitted to escape. If not required by the sixth day, the suture is cut, the gauze removed and the opening allowed to close. If the suture is not needed, the healing is not prolonged; if needed, closure is usually effected within a short time (Fig. 4). This safety valve is of great benefit in about 15 per cent. of the cases. Should the peritoneal cavity be contaminated, drainage is secured by stab incision with drain in the loin.

The method of operation described is safe and remarkably effective for tumors, granulomas and fistulas. In cases of toxemia the general condition is improved, and in 80 per cent. the constipation is improved. The general improvement made in the latter cases is somewhat less marked than in operations of necessity for tumor and obstruction (Fig. 5). In operating on the left colon for obstructive conditions by the Mikulicz-Bruns method or by resection, appendicostomy is of great value.

Not including the rectum, there were 262 resections of the large intestine for malignancy. Of the patients who recovered and who were operated on more than five years ago, 54 per cent. are alive. Of those operated on more than three years ago, 67.5 per cent. are alive.

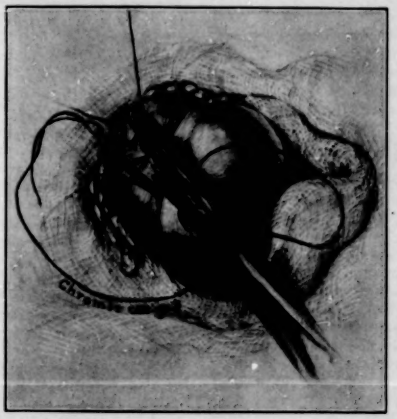

Fig. 5.—Aseptic method of inverting mucous membrane by a running suture.

From January, 1898, to Dec. 31, 1915, the right half of the colon was resected for tumors, disease and stasis in 235 cases, with an operative mortality of 12.5 per cent. In our early work the operability was lower, the mortality lower and the permanency of cure higher. This led to an increase in the operability of these otherwise hopeless cases, with the result that there was an increase in the mortality and a decrease in the permanency of cure; but considered from the standpoint of the total number of cases seen, a great increase in the number cured. The present operability is 62 per cent. Unless the operability percentage is given, statistics in regard to the results of operations for malignancy are misleading.

Moderation in Eating.—For the sake of health, medicines are taken by weight and measure; so ought food to be, or by some similar rule.—Skelton.

THE VALUE OF ILEOSIGMOIDOSTOMY AND SIMILAR PROCEDURES

IN THE TREATMENT OF CHRONIC MULTIPLE ARTHRITIS *

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Whether or not its truth is admitted, the originality of Lane's idea and the brilliancy with which he translated the thought into action must be admired. Chronic infectious arthritis had long been a troublesome thorn in the side of the profession; in an occasional case there was spontaneous recovery or amelioration of symptoms following this or that mode of treatment, but it was generally recognized as a fact that in the average case of chronic infectious arthritis medical science offered little hope of cure. The many theories as to the etiology of the disease and the numerous methods advocated for treating it bore strong witness to our lack of definite knowledge as to its real cause, and despite treatment, the sufferers usually continued to suffer and, through alternating periods of relative quiet and of acute torture, passed slowly on into years of utter helplessness. What wonder, then, that the attractive theory of intestinal stasis with its resulting sequelae of microbic invasion, toxemia and joint infection and its possible relief by a relatively safe and simple surgical operation should draw wide notice and that both surgeon and patient should hasten to test in the fire of experience the practical worth of the novel thought! For it is only through actual experience on human beings that the degree of worth in such an idea can be truly estimated, since under no other circumstances can the real conditions of the disease be reproduced. It is only because of this fact and because the present number of reported observations is relatively small that Dr. MacAusland and I presume to present to this section the result of our work in such a limited number of cases. Our paper makes no pretense of being anything but a record of the effect, immediate and remote, of ileosigmoidostomy, etc., in cases of chronic, multiple nontuberculous arthritis.

Other series have been published, the most significant, perhaps, being one by Fagge and Hughes[1] and another more recently by Rea Smith[2] in a paper presented before this section last year.

The first-mentioned authors draw their material from the records (from 1909 to August, 1914) of Sir

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Fagge and Hughes: Brit. Jour. Surg., 1914-1915, ii, 657.
2. Smith, Rea: Ileocolostomy and Colectomy for Arthritis Deformans, THE JOURNAL A. M. A., Aug. 28, 1915, p. 771.

Arbuthnot Lane and give the results obtained through the performance of colectomy (four cases) and ileosigmoidostomy (three cases) in persons with multiple, nontuberculous arthritis. The immediate results were good in all instances; the pain and the joint stiffness were less, and the patients all felt more comfortable. The late results were in the main fairly satisfactory. Two cases could not be traced; in one, in which a colectomy was performed, the patient died of pulmonary embolism on the thirteenth day; of the other four, two may be classed as recoveries (one and one-quarter and two and one-half years after operation) to all intents and purposes, one as continuing to improve at the end of three months and the fourth as unchanged, two and one-half years after operation.

Of course, recovery, when spoken of here in connection with joints, is not to be understood in the sense that bony ankylosis and gross deformities disappeared. It means that such initial conditions as swelling, effusion, tenderness, etc., and their immediate sequelae were remedied.

I have been unable to find a detailed account of Smith's cases, but his results are remarkably good. He reports the outcome of his experience with fourteen patients. In two instances he did a primary colectomy, and this procedure was followed by a marked benefit to both patients. In twelve of the cases, ileosigmoidostomy alone was done as a primary measure. One of the patients died on the fifth day in uremic convulsions, a death which may not be laid at the door of surgery, as Smith notes; five were very greatly improved, three to the stage of resuming their usual work; in the remaining six patients, while temporary improvement followed the operation, it was not permanent and they soon relapsed into their former conditions; four of the six underwent a second operation, colectomy, with great and seemingly permanent benefit to three of them. How long after operation the report was made, I do not know. Thus, ten of the fourteen patients on whom Smith operated were either cured or put in such condition that they could get about without assistance, a truly remarkable showing.

Our series consists of ten cases; in eight, ileosigmoidostomy was done. In all these the ileum was cut across about an inch and a half above the ileocecal valve, and the end of the distal portion was inverted and closed; in four instances, the end of the proximal portion was also closed and a lateral anastomosis with the lower sigmoid carried out; in the other four, the open end of the proximal arm was implanted into the side of the sigmoid. In one of the remaining cases cecosigmoidostomy was done; in the other, a hemicolectomy, the proximal end of the ileum being implanted into the side of the distal portion of the transverse colon. There was no mortality. In one case, the only one in which a cure really followed, a technical defect gave rise to a fecal leakage which was successfully repaired at a second operation.

The immediate effect of operation in these cases is always a beneficial one, remarkably so in some instances. This fact has been noted by others. In one case of Lane's series, the day following operation saw a striking change in the patient's condition; there was an increase of 25 degrees in the extension of the knee-joints and, for the first time in six months, the patient could hold a pen in her right hand and could write her name. While I have observed no such wonderful alteration as this in the joint conditions, it cannot be denied that in many ways the patients receive marked and speedy relief from the operation. The cold, moist hands and feet become warm and dry; the tender, painful joints feel easy and comfortable; the clammy sweats cease, and the patient experiences and admits a general betterment. In other words, the purely toxemic symptoms are relieved and the relief comes quickly, in from forty-eight to seventy-two hours, as a rule. Later, in favorably influenced cases, there follow subsidence of the swellings about the joints, especially the small ones, an increase in the degree of joint motion and a change for the better in the regularity and character of the bowel movements. Even in cases that later relapse, the amelioration may continue for some time, weeks, months or even a year (as happened in one case of our series) and thus give promise of permanency. Usually, however, in our experience the gain has been general rather than local, temporary rather than permanent. The general bodily health improves and continues to be better permanently, while the joint conditions, though they may be relieved for a longer or shorter time, usually relapse ultimately into their former or even a worse state.

In our series of ten cases we can boast of but one cure. After ten years of more or less constant trouble with hands, hips, knees, ankles and feet, a young man willingly submitted to ileosigmoidostomy, and now, almost three years after operation, remains entirely well. I wish I knew exactly why. A second patient, ten months after a hemicolectomy, reports herself as continuously improving both in her general and in her arthritic condition. She is one of the two patients who complain of postoperative diarrhea; she has six or seven bowel movements daily; in the other patient, diarrhea is only occasional. A third patient gained much for a year and then fell back into her former wretched state. To the other seven, operation gave no relief as far as their joints were concerned, but it improved their general health; four state that their joint condition is worse. These reports indicate the condition of our patients from one and one-half to three years after operation.

In these three series, then, we have to do with thirty-one cases of multiple infectious arthritis. Two of the patients could not be traced, and hence the late result in these cases is not known. Of the twenty-nine others, twelve were cured or greatly benefited, five by colectomy (primary or secondary) and seven by simple ileosigmoidostomy. Considerable improvement followed colectomy in three cases, and ileosigmoidostomy in one. Colectomy left the condition unchanged in one case, and ileosigmoidostomy in six; four of these patients later submitted to secondary colectomy with permanent (as far as we may judge) relief to three of them. Four patients were worse after ileosigmoidostomy than before it. One death (pulmonary embolus) followed colectomy, and one (uremia), ileosigmoidostomy.

In estimating the value of any mode of surgical treatment, proper regard must be had for both the mortality and the morbidity that is connected with its accomplishment. Sir Arbuthnot Lane[3] believes that the immediate risk of ileocolostomy is greater than that of colectomy, and that the convalescence after the latter is far less bothersome. This statement may

3. Lane, Sir Arbuthnot: Brit. Jour. Surg., 1914-1915, ii, 599.

represent the truth in Lane's clinic, but I am sure it would not hold true for the average surgical clinic in this country: for Lane has brought his own technic to a very high level in the performance of colectomy, and has had wider experience with that operation than any of us will probably ever have. It seems certain, however, that the mortality from neither procedure is prohibitive. The death from uremia in one of Smith's patients was not unexpected; the surgeon had recognized the condition before operating, and the patient had full appreciation of the chances and was willing to take the risk; the fault, if fault there was, is neither surgery's nor the surgeon's. The patient to whom pulmonary embolism brought death ran the same risk as the healthiest of us would have to take, if he submitted to a laparotomy for any cause whatever. If we may draw conclusions, then, from a study of so limited a number of cases, it is a safe assumption that the mortality rate need not cause undue apprehension. Nor can any increase in morbidity be said to follow these procedures. In only two cases did diarrhea result, and diarrhea is the only postoperative sequela we encountered; in one it was almost negligible, being only an occasional event, while, in the other, it was

SUMMARY OF RESULTS IN THIRTY-ONE OPERATIVE CASES

Results	Colectomy	Ileosigmoidostomy	Total
Cured or greatly improved	5 (2 primary, 3 secondary)	7	12
Considerably improved	3	1	4
Worse	..	4	4
No change	1	6; 4 other cases (a total of 10) were not influenced by ileosigmoidostomy and had a subsequent colectomy	7
Death	1 (pulmonary embolus)	1 (uremia)	2
No report	2	..	2
Total	12	19	31

troublesome. In the balance against this must be weighed the fact that amelioration in general health was attained in all the patients, that a better working condition of the bowels was secured and maintained, and that even those whose joint conditions grew worse were suffering from the effects of the uninfluenced disease and not of the operative procedure.

When and on what grounds, then, shall abdominal section be urged in these cases? Of course, the earlier the patients reach the surgeon the better is the chance of cure. When advanced destructive joint changes have taken place, no treatment can bring about complete relief. It is unfortunate but true that many sufferers from chronic arthritis pay little attention to the often slight primary signs of the disease, the discomfort and the stiffness frequently confined for a time to the finger joints, the wrist, etc. It is only when the trouble has spread to other and larger joints that the patient takes alarm and seeks a physician, who himself often fails to appreciate the possibility that some focus of infection, more or less obscure, may be the active cause of the trouble and by his hit-or-miss method of treatment postpones still further the introduction of at least intelligent attempts at relief. It should be emphasized that, just as soon as there arises even a suspicion that the process may have an infectious cause, painstaking search should be made for that cause. The mouth, gums, teeth, tonsils, throat, nose and accessory cavities should be carefully investigated. Roentgenograms of the skull, with special reference to diseased sinuses and to the possibility of slumbering, unsuspected infections about the dental roots, should be made. Urethral, vaginal and uterine discharges should be stained and examined microscopically. The urine should be carefully searched for evidence of renal infection. Hugh Young warns us, too, that the seminal vesicles may harbor the guilty organism. When all other possible sources of infection have been excluded, either through demonstration of their absence or through their elimination by suitable treatment, then attention should be turned to the intestinal tract and to the possibility of intestinal stasis, the frequent predisposing cause, if current opinion is correct, of the formation and absorption of intestinal toxins and perhaps even of microbic invasion of the blood current. Smith believes that the intestine may be the real primary source of many of the foci of infection which themselves are now regarded as truly primary. The cure of some cases of general infection without recourse to treatment directed to the intestinal tract is not confirmatory of the universal truth of this opinion.

The discussion of just what intestinal stasis is, of its cause and of just how much dependable knowledge of either or both may be obtained from the average roentgenographic examination is most interesting. It must be admitted that there is lack of agreement on many phases of this topic. Mr. Arthur Keith[4] of London, for instance, studied roentgenograms by Jordan of many cases of intestinal stasis (a term, by the way, which he considered "somewhat elastic"), and never succeeded in finding one which gave him satisfactory evidence of pressure or traction of a peritoneal band on the intestinal tract. His anatomic investigations on colons removed by Lane simply strengthened him in this opinion. In fact, he believes that neither position of the intestine nor peritoneal bands play an important rôle in the causation of chronic intestinal stasis, which, in his mind, is always secondary to a disorder of the neuromuscular mechanism of the bowel. All this is quite contrary to the impression that may be taken from the writings of other men. Again, Rinkenberger[5] of Los Angeles, working in Lane's clinic in 1911, demonstrated in healthy young men roentgenograms absolutely identical with those which Lane was showing as indicating intestinal stasis. My own experience with roentgenologists in this field has led me not to accept their interpretations as absolutely definitive. With our patients, the assumption of the presence of intestinal stasis and the consequent recommendation of operation has been reached more through a process of exclusion than through a certain demonstration of the stasis by roentgenograms. A careful search was always made for sources of infection other than intestinal. These being absent or eliminated, the presence of intestinal stasis and toxemia was assumed. The roentgenologic examination was regarded simply as or as not corroborative. It may be said in passing that in all our cases the roentgenologist reported "ileac stasis." In none of the cases, however, was an evident anatomic cause for the stasis demonstrated at operation.

4. Keith, Arthur: Brit. Jour. Surg., 1914-1915, ii, 576.
5. Rinkenberger, F. W.: Abstr., THE JOURNAL A. M. A., Aug. 28, 1915, p. 770.

I must admit that my mind is not entirely clear either as to why operation benefits some cases and does not influence others, or as to just what it is that operation does in some cases and fails to do in others, with or without relief to the patient. The doing away with the so-called ileal stasis by drainage of the terminal ileum is not the curative, or, perhaps, I should say not the only curative, factor in a successful operation; for, in the sole case in which we can honestly claim a real cure, a roentgenogram taken a month ago (three years after the operation) shows a markedly dilated ileum and all roentgenographic signs of ileac stasis, twenty-four hours after the injection of the bismuth meal (4 ounces of bismuth in a pint of buttermilk). Yet the man's general health and joint conditions are entirely normal. It may be that Smith's idea is the correct one and that the factor essential for success is either removal of the colon or, if the colon is left in place, absence of any obstruction in the colon between the cecum and the point of anastomosis; in other words, if the colon is sidetracked, the segment thus excluded must be freely open, entirely unimpeded and fully capable of emptying itself. Supportive of the correctness of this idea is the fact that in seventy-two hours the colon in our cured patient was practically entirely free of all the bismuth introduced through a bismuth enema. Only a very small remnant remained in the ascending colon, and for some reason that small remnant was still there thirty days after the giving of the enema.

With relatively so little clinical material on which I may base a judgment, I do not feel justified in drawing conclusions of a definite character as to the general efficacy of either colectomy or ileosigmoidostomy in these cases. My present feeling in the matter may be set forth about as follows:

1. In many instances heretofore we have been dealing with long-continued, advanced cases in which neither operative nor any other method of treatment may be justly expected to be of much avail; hence, cases in which the probability of an intestinal source for the infection can be established should have an early operation.

2. Before advising abdominal operation in any case, all foci of infection other than intestinal should be sought for and, if present, should be eliminated.

3. Every patient to whom operation is proposed should have set before him clearly the pros and cons of operation, its possibilities and its uncertainties; for, while I am sure that operation has some influence on all cases, since, in our experience, it has never failed to help the purely toxic symptoms, yet its answer to our chief demand, the relief of the joint conditions, is disappointing in its uncertainty and frequently in the results obtained.

4. Even though I believe that a somewhat greater degree of danger is attached to the performance of colectomy, yet I should at present advise it rather than a simple short-circuiting operation, because of Smith's excellent results with the former as a primary measure, and still more because of his successful use of it as a secondary procedure in cases uninfluenced by a previous ileosigmoidostomy.

5. In no case, whether or not operation is considered, should such general measures as outdoor life, proper diet, exposure to sunlight, etc., be neglected.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MAYO AND BOTTOMLEY

DR. REA E. SMITH, Los Angeles: The two postoperative complications which arise most frequently to spoil the success of a Lane operation are (1) backing up of fecal matter into the cecum and (2) unusual postoperative adhesions. The most frequent cause of failure in Lane's work is the unusual development of postoperative adhesions. The symptoms usually become manifest about the end of the first year after operation. At that time the patients may have a relapse and, as a result of the narrowing of intestines by the contraction of adhesions they may have more stasis than they had before the original operation. These adhesions are due to infection at the time of operation. The Lane procedure is open to a technical criticism. Lane sutures through and through the infected colon wall—the infected silk soils his gloves as well as the abdominal packs which it touches—thus rendering the whole field unsterile. The same infected hand then goes into the pelvis and lifts up the small intestines so that the split in the mesentery can be stitched. The adhesions we find on secondary operation after Lane's short circuiting operation are in patches, widely disseminated patches of local peritonitis due to infection at the time of the original operation. Recognizing this fact it is possible to do a short circuiting safely. The operation should be changed so that the colon is opened last and the field treated as infected from that time. In the Mayo right-sided colectomy the abdomen is not invaded after the colon is opened. The Murphy button is used and there is much less likelihood of infection and therefore of failure due to adhesions. I reported fourteen operative cases of arthritis last year. I am not as enthusiastic now as I was at that time. Twelve patients are living, three of the twelve are perfectly well at twenty-eight, twenty-six and eighteen months following operation. The patient, whom I showed here last year as a cure at the end of fourteen months, had to be reoperated on two months later for acute obstruction in the ileum due to postoperative adhesions. Because her obstruction was high she did not have a return of her joint symptoms, and she has had no return since. Her abdomen was full of adhesions from patches of local peritonitis following the Lane short circuit operation. Of the remaining ..ine cases in the series, two show no change; the other seven are all better than they were a year ago, but they have not gone on making the rapid spectacular recovery that the other three have made. None of them would go back to their former condition, because of the improved general condition and freedom from pain.

DR. W. R. MACAUSLAND, Boston: My experience with this procedure is based on a series of ten patients in whom the routine methods of treatment had failed; that is, no source for the infection could be found in teeth, tonsils, sinuses, kidneys, etc., and furthermore their intestinal symptoms were not relieved by the ordinary medicinal means. I cannot but feel strongly that the source of many arthritic conditions is to be found in the intestinal tract and the large majority of chronic arthritis cases have been unrelieved by the ordinary methods because this has been overlooked. In spite of the removal of tonsils and drainage of foci at the roots of teeth, most of these joint conditions are slowly progressive. There are all stages from the initial infection to the stage showing much destruction of cartilage with great disability and obviously in order to effect any substantial relief treatment must be inaugurated early in the course of the disease, before severe joint changes have occurred. When making a comparison of results by various methods we must make allowance for the joint changes which have taken place in each case. It may be well to call attention to the fact that the so-called "toxic arthritis" is coming more and more to be considered in this class. "Toxic" as a term must be restricted to such changes as are found without the presence of organisms, and in which it is reasonable to suppose no organisms are present. Those arthritic conditions resulting from chemical changes from disturbed metabolic conditions are also strictly omitted from consideration in this discussion. It is well known, however, that chemical, toxic and bacteriologic changes fre-

quently give approximately the same findings; that is, one may have a destructive process accompanied by some form of exudate from any of these causes. It is well to consider all cases of polyarthritis, progressive in nature, with all signs of an active process in and about the joint, as being actually infected with organisms metastatic from some focus, known or unknown. The ten cases operated all presented intestinal symptoms and chronic constipation. It was observed frequently that slight exacerbations in the disease were due to an acute intestinal upset, accompanied by temporary diarrhea. The ordinary signs of intestinal stasis were present in all. Following the failure of ordinary methods and after demonstrating an actual ileostasis as being present, these ten patients were referred to Dr. Bottomley for a surgical correction of their intestinal condition.

DR. JEROME MORLEY LYNCH, New York: With reference to the so-called ileocecal valve: It seems to me that this segment of the intestinal tract being in the limelight it is about time that we come to some conclusion as to whether it is a muscle or a valve. If a muscle, then no operation can possibly be of any benefit. If a valve, then operation, if one follows Nature, will probably prove useful. It seems remarkable to me that the wonderful paper of Elliot has been overlooked for seven or eight years, because it must be at least that time since the paper first appeared in which he made a number of very exhaustive and accurate experiments with regard to the value of this segment of the gut. I think he has shown conclusively that this is not a valve but a muscle. We have been able to show on humans that by the injection of ten minims of epinephrin you can shut a so-called leaking valve as tight as a drum. Thus some patients were examined after barium enema and the insufficiency was promptly corrected for several hours by epinephrin. The connection between the internal secretions and the mechanism of this muscle is very important. What the relationship is we do not know as yet. Draper and I consider it probable that the Bauhinian valve has about the same value to the economy as the ureterovesical, which we have shown to be about 10 per cent.; the neuromuscular control being 90 per cent. Dr. Stockard of Cornell proposed for this operation of Dr. Mayo's the term "developmental reconstruction." It means something definite. It means placing the colon in a position that it occupies when rotation occurs at about the third month of fetal life. We have performed this operation twenty-eight times in all. First, for primary cancer of the ileocecal sphincter, for segmental polyposis, for dysmorphia of the elbow-deformity type at the hepatic flexure. We have performed cecosigmoidostomy six times. Every case has failed. We have done cecocolonic plication in seven cases, simply for comparative study.

DR. J. E. TUCKERMAN, Cleveland: I would ask a question of Dr. Mayo. On what can he base the statistics or percentage of operability; what is the standard on which he bases a percentage of operability? How can he compare percentages of operability between one surgeon and another since his own opinion as to what is and is not operable is undergoing a change? Is the operability based on the mechanical feasibility of doing the particular procedure or on the judgment of the surgeon as to whether that particular procedure is justified?

I was surprised in the discussion to learn that all adhesions are due to infections. Dr. Smith made that statement. I think it is hardly possible Dr. Smith means that.

DR. J. S. HORSLEY, Richmond, Va.: Dr. Lynch has spoken of the ileocecal valve being a muscle and he says that he proved this by injecting epinephrin in cases in which the ileocecal valve was incompetent and found that it caused contraction and closure of the valve. Cannon and other physiologists have shown that while epinephrin causes contraction of the smooth muscle in the systemic blood vessels of the limbs and surface of the body it not only fails to cause contraction of the smooth muscle of the intestine, but actually relaxes it. In fact, one of the most delicate tests for the presence of epinephrin is the relaxing effect it has on a segment of small intestine when attached to a recording apparatus.

DR. J. W. DRAPER, New York: Epinephrin will relax the musculature of the small intestine, but contract that of the ileocolic sphincter. If it is, given hypodermically to an individual showing insufficiency of the sphincter it will normally close that sphincter. Failure to do this may be a means of differentiating between functional and mechanical derangement of the region. Dr. Lynch and I resected the right side of the colon. The woman was 50 years of age, was in the terminal stage of arthritis, in constant pain, unable to turn over in bed, unable to use her knife and fork, unable to write. The extraordinary thing was that within twenty-four hours from the colonic reconstruction that woman could turn over in bed and she herself commented on it. In three days the pain was gone and she was able to sleep without hypnotics. The rapidity of this clinical improvement suggests to us that there is a change in the biochemistry of the intestinal epithelium, perhaps throughout the canal, which accounts for the improvement, for it is impossible to believe that an interference with bacterial migration through the gut wall by operative removal of a diseased segment can be the only source of the improvement. Only those cases should be treated by developmental reconstruction of the colon in which the most scrupulous study had excluded all other sources of infection. It would be deplorable for this operation to come into general use for the treatment of arthritis.

DR. J. E. JOHNSON, Memphis, Tenn.: Dr. Mayo's operation has several advantages. The end of the colon cannot drop down, hanging from the omentum, thus forming a pouch. He saves the omentum, which has the advantage that there is less danger of adhesions. His technic is good; there is less danger of infection. We become bewildered with the many theories advanced as to the cause of a condition which necessitates colectomy. Let us look at just what we find. It is obvious that the trouble is in the ileocecal region. On one side of the ileocecal valve we have the ileum, the great absorber; on the other side the cecum or sewer. If we have the contents which have been retained for too long a time in the cecum, regurgitated into the ileum, what is the result? We have a putrid material, about one-half by weight bacteria thrown into the great absorber. We have a toxic poison plus a bacterial infection. The colon is built for a sewer and its mucosa has its natural defenses against the contained bacteria. The ileum is built for an eater and has no such defenses. From the toxic poison we get a splanchnic paralysis, which is just as characteristic of this condition as drop wrist is of lead poisoning. From the bacteria absorbed in the ileum, the chronic infection, a terminal ileitis and a pericolitis, result, to combat which Nature builds stronger defenses, consisting of veils or membranes. These membranes when rotated gather together in strong bands. These membranes contract as all inflammatory tissues will, and secondly, we have the distortion. It will be noted that this condition appears at no other location; they are all alike only in degree. I have not seen a case of these membranes without visceroptosis nor a case of visceroptosis without these membranes. I mean where I have examined the patients with the fluoroscope in the vertical position before operation. This seems quite significant. It will be noted that all of these patients have suffered from toxic sick headaches when they are pale, sweat and vomit. These headaches cannot be laid to any dietary indiscretion or the regurgitation through the imperfect ileocecal valve which causes the sick headaches in youth, and which later causes splanchnic paralysis and the formation of inflammatory membranes. We have done eleven colectomies for stasis, some right side and others to the sigmoid; we have anastomosed the ileum into the upper part of the rectum, by the end to side method of Lane. Ten of these patients are living and doing well. I should advocate a right colectomy in all cases in which there is no obstruction in the distal colon.

DR. CHARLES HORACE MAYO, Rochester, Minn.: If, when compiling the statistics for malignancy, we disregard the patients we have turned down, and those who either die immediately after operation or look forward to recurrences,

and accept only those who are decidedly benefited by operation, we get figures which are not a very good basis for conclusions by others as to what may be done in these fatal conditions. Therefore, in Winter's statistics you must take into consideration all of the patients you see — any that you run across. If you do not operate, they are in the class of those who are going to die of the disease. We are trying to find out how many die of the disease and how many can be saved. Sometimes the Roentgen ray is a wonderful aid. We have tumors of the liver, malignant involvement of the stomach, secondaries, extraordinary tumors that can be felt at the bottom of the pelvis by palpating the rectum, and extraglandular involvement in the supraclavicular fossa, so that many patients would be refused operative treatment whose condition needed something immediate. Taking the whole list and locating the disease at only one point, fixation, we used to say, meant contraindication for the possibility of cure. We now know that that is wrong and, therefore, when we do not find metastasis at a distance, we now at least explore all fixed tumors of the large bowel and make most extensive operations, knowing that if we do not do it, we are condemning the patients to death and suffering. Concerning some of the other points brought up, I believe the discussion has been very fair. It is unfortunate that sometimes in the development of the new things in surgery their use in therapy is too greatly condemned, so that surgeons are kept from doing work along these lines for those who are suffering, and no method has been developed as yet for their relief. I would like to see these innovations going on so that the men having the obsession be given sufficient amount of rope to either develop something or hang themselves.

SPLENECTOMY FOR HEMOLYTIC JAUNDICE *

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The past few years have shown a great increase in the interest manifested by American surgeons in the surgery of the spleen. Splenectomy has been demonstrated to be a safe and effective means of curing certain diseases (for example, Banti's disease), and is extensively employed in other conditions in which its ultimate benefit still has to be proved by a more prolonged study and report of late results.

Among the conditions which seem to be promptly and permanently benefited by splenectomy is the group of so-called hemolytic jaundice cases, which occur in two forms, the congenital and the acquired.

The accumulating evidence of the results of splenectomy has proved the etiologic relation of the changes in the spleen to the disease. The former hypothesis of essential hemolysis must be abandoned. What the exact nature of the process may be is still more or less obscure, but that the spleen plays the most important part is certain. The constant presence of urobilin and urobilinogen in the urine is simply an evidence of the destruction of the hemoglobin molecule in the process of hemolysis, and these substances disappear soon after splenectomy is performed.

No bile is found in the urine unless there is a complicating disease of the biliary tract. This complication has been noted many times.

In the congenital group we have the well-recognized familial type, in which heredity plays such a striking part, and also congenital cases, in which no family history exists, but in which the jaundice appears at birth or in early infancy and persists throughout life or until relieved by operation.

The acquired type forms another distinct clinical group, the symptoms of which closely follow those of the congenital type. We have had three typical cases in patients on whom splenectomy has been performed in the second surgical division of the Roosevelt Hospital, since May, 1912, when the first case to be reported came under my care. The patient, a young woman, aged 30, of the congenital, nonfamilial type, was the first patient on whom splenectomy was performed for congenital hemolytic jaundice in this country.

Her history was as follows:

F. N. (history No. B2654), a married woman, aged 30 years, on May 6, 1912, was admitted to the second surgical division of the Roosevelt Hospital, transferred from the medical service of Dr. Evan Evans. Her only complaint was a mild degree of persistent jaundice, she being otherwise healthy. She was one of a family of eleven, her father, mother, three brothers and seven sisters being alive and well. None of them had ever been jaundiced, nor was there a history of jaundice in any branch of her family. She was the first child, born at full term in normal labor. Jaundice was first noticed when she was 3 days old, and this had continued all her life. She had measles, mumps and whooping cough as a child, but no other illnesses. Her appetite was good, she slept well, took plenty of exercise and drank no alcohol, and coffee and tea only moderately.

The jaundice was present in mild degree with no other symptoms until she was about 21 years of age, when she first had an attack of deepening of the jaundice. Since that time similar periodic attacks (acholuric crises) have occurred, with a general tendency to deepening of the jaundice, but with no other symptoms. She has never had itching, slowing of the pulse, or any of the symptoms which accompany an ordinary obstructive jaundice.

In July, 1907, in Baltimore, cholecystostomy was performed, but no gallstones or other lesions of the biliary tract were found. Jaundice returned and persisted as before as soon as the biliary fistula healed.

On January 22, 1909, two and one half years after the cholecystostomy, she was admitted to the Johns Hopkins Hospital, and was under observation by Dr. Thayer for about two weeks. A diagnosis of congenital hemolytic jaundice was made by Thayer,[1] who did not advise operation. Her red cell fragility tests at that time were practically identical with those taken by us three years later. Thayer stated in his comments that "in congenital hemolytic jaundice recovery is unknown, but some improvement may be obtained by persistent treatment with iron." Pathologic changes in the spleen and splenomegaly were recognized, but their definite relation to the etiology of the disease was not appreciated, and the cause of the fragility and increased hemolysis was thought to reside in the blood itself. From Jan. 26 to Feb. 11, 1911, she was in a hospital, in New York, again for the jaundice. A diagnosis of congenital stenosis of the common duct was now made, but operation was not advised. From July 16 to Aug. 14, 1911, she was under treatment in the same hospital, ill with typhoid fever, and from August 18 to September 12 she was back with a relapse.

The persistence of the jaundice so preyed on her mind that on March 5, 1912, she was again operated on, at the Roosevelt Hospital, first surgical division, in the hopes of finding calculi or some lesion of the biliary tract. No calculi were found, and no lesion of the gallbladder or ducts; a few whitish spots on the surface of the left lobe of the liver were seen, and one was excised for examination. It showed simply anemic, degenerated liver cells. The operation was a simple

* The first three papers in this symposium, by Drs. Lee, Minot and Vincent, Krumbhaar and Miller, appeared in THE JOURNAL, Sept. 2, 1916, pages 719 to 730.

* Read before the joint meeting of the Section on Practice of Medicine and the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Thayer and Morris: Bull. Johns Hopkins Hosp., 1911, xxii, 85.

exploration. On April 10, 1912, she was readmitted to the Roosevelt Hospital, medical division, service of Dr. Evans. Careful studies were made by Dr. Evans and Dr. Mortimer Warren, pathologist to the hospital, whose report, which follows, covers the periods before and after splenectomy.

The jaundice was general, of a moderate degree, lemon yellow in color, lacking the greenish tinge of obstructive jaundice. The edge of the spleen was 4 to 6 cm. below the costal margin.

Urobilin was present in the urine, but no bile. Bile was present in the feces, which were of normal color. The Wassermann reaction was negative.

Blood examination showed hemoglobin 63 per cent., red blood cells 4,400,000, and white blood cells 8,000. The differential count showed polymorphonuclears 65 per cent., lymphocytes 20.5 per cent., large mononuclears and transitionals 10.5 per cent., eosinophils 3.5 per cent., and basophils 0.5 per cent. The red cells were small and of good color, and there were no nucleated red cells. Plates were abundant. About 20 per cent. of the red cells showed postvital reticulation. Five fragility tests taken between March 16 and April 22, 1912, before splenectomy, showed, as an average, a minimum resistance of 0.72 per cent., and a maximum resistance of 0.27 per cent. On May 9, two days after splenectomy, test showed a minimum resistance of 0.72 per cent., and a maximum of 0.36 per cent. Four tests taken from May 13 to May 25, 1912, six to eighteen days after splenectomy, gave as an average a minimum resistance of 0.50 per cent., and a maximum of 0.32 per cent. Test made Sept. 9, 1912, four months after splenectomy, gave a minimum resistance of 0.48 per cent. and a maximum of 0.30 per cent. Test Oct. 8, 1915, three years and five months after splenectomy, showed a minimum resistance of 0.40 per cent. and a maximum of 0.35 per cent. The hemoglobin, which was 65 per cent. two days after splenectomy, reached 80 per cent. on June 7, 1912, one month later. The red blood cells, at first slightly reduced, were about normal. Red blood cells showing postvital reticulation appeared only in moderate (normal) numbers after operation. On May 9, 1912, two days after splenectomy, examination showed leukocytes 30,000, polymorphonuclears 80 per cent. On Oct. 9, 1912, four months after operation, examination revealed leukocytes 11,000, polymorphonuclears 53 per cent., lymphocytes 22 per cent. Examination of blood Oct. 18, 1915, three years and five months after operation, gave as a result, hemoglobin 95 per cent., red blood cells 4,204,000, white blood cells 13,000, polymorphonuclears 58 per cent., lymphocytes 30.3 per cent., transitionals 7.9 per cent., eosinophils 3.6 per cent., with plates abundant. The red blood cells showing postvital reticulation were 0.5 per cent.

On the advice of Drs. Evans and Warren, and in the belief that pathologic changes in the spleen were responsible for the excessive hemolysis, and possibly for the fragility of the red cells, splenectomy was performed on May 7, 1912. There were no adhesions, and the operation was technically simple and well borne.

The spleen was only moderately enlarged, weighing 360 gm. and measuring 19 by 12 by 6 cm. Gross section showed no evidence of pathologic change beyond congestion, except for the presence of numerous light-yellow, firm nodules from 1 to 4 mm. in diameter. The surface was roughened with many light-colored pinpoint spots scattered over the surface.

Microscopic examination showed marked congestion, with much of the blood interstitial. There was no marked increase in fibrous tissue. The arterioles appeared thickened, and nodules were noted in areas of sclerosis, showing with proper stain remains of elastica. They were, therefore, sclerosed arterioles, possibly the result of typhoid. Follicles were somewhat crowded out.

A diagnosis was made of congestion of the spleen, chiefly interstitial. Except for a mild, left-sided pleurisy, with effusion, which developed on the sixth day and lasted about a week, convalescence was uninterrupted. Diminution in the jaundice could be definitely noted on the third day after operation, and by the tenth day, for the first time in her life, she was entirely free from jaundice, and has remained so ever since. The prompt and permanent disappearance of the jaundice, together with the great improvement in the red cell resistance, has been most satisfactory.

This case presents several striking features, among which was the marked degree of fragility of the red cells before operation and their prompt return to the normal after splenectomy, a result which has been by no means uniform in the reported cases. Another was her rather checkered surgical experience, owing to the fact that her treatment coincided with the developmental stage of our knowledge of the condition, and of the etiologic relation of the diseased spleen to it. As Chauffard so aptly remarks, "she was more icteric than sick," but in spite of this fact, the presence of the jaundice and the feeling that she was different from other healthy women so preyed on her mind that she persisted in her efforts to find a cure for her malady.

The case presented the characteristic findings of hemolytic jaundice, as described first by Hayem[2] in 1898, by Chauffard[3] in 1907, and by Elliott and Kanavel[4] in their interesting case of the familial type, and many other careful observers, namely, persistent, nonobstructive jaundice without itching, slowing of the pulse or the presence of bile in the urine; paroxysmal exacerbations of the jaundice, at times accompanied by dull, aching pain in the upper abdomen; chronic splenomegaly of a moderate degree; secondary anemia of a moderate type; fragility of the red cells of a very marked degree, with complete return to the normal after splenectomy; increase in the number of reticulated red cells to 20 per cent., which fell to normal (0.5 to 1 per cent.) after splenectomy; the presence of urobilin and urobilinogen in the urine.

The second case was of the acquired type, of short duration, the patient having had symptoms for only nine months preceding the operation. As has been previously noted in this type, the onset of the jaundice was ushered in by an acute illness, accompanied by fever, after which the jaundice persisted and increased in degree without the occurrence of definite crises.

In contrast to the preceding case, the red cell fragility in this case was not very marked, and did not change perceptibly after splenectomy. The vital stain reticulation of the red cells reached 16 per cent. and dropped to normal after operation. The secondary anemia was moderate in degree, the hemoglobin and red cell count approaching the normal soon after operation. Auto-agglutination tests were negative, as in Michelis' case, in contrast to the experience of Widal, Abrami and Brulé,[5] who found it constantly positive in the acquired type, and absent in the congenital and familial types. Urobilin and urobilinogen were present in the urine, and the feces were normal in color and contained bile. Splenomegaly was pronounced, the spleen weighing 800 gm. Splenectomy was followed by a prompt disappearance of the jaundice and a complete return to health.

An abstract of this patient's history follows, and further detailed studies of the case have been published by Dr. G. A. Friedman, from whose service at the Vanderbilt Clinic he was referred to me for operation.

M. T. (history No. B7036), an Italian, a single man 18 years of age, was referred from the Vanderbilt Clinic early in November, 1915, where he had been carefully studied by

2. Hayem: Presse méd., 1898, i, 121.
3. Chauffard: Semaine méd., 1907, No. 3, p. 25.
4. Elliott and Kanavel: Surg., Gynec. and Obst., 1915, xxi, 21.
5. Widal, Abrami and Brulé: Presse méd., 1907, lxxxi, 641.

Dr. G. A. Friedman, who made a diagnosis of acquired hemolytic jaundice and advised splenectomy. Except for diseases of childhood, the nature of which he did not know, the patient had had no previous illness. He had come to America from Italy eighteen months before. Jaundice was first noted about nine months before he came to the hospital, and had been persistent up to the time of admission.

Examination showed a rather slender, well-nourished young man, with marked general icterus of a lemon yellow hue. His spleen extended to within an inch of the umbilical level in the mammary line.

The urine contained urobilin and urobilinogen; the feces were of normal color and contained bile and also urobilin.

The blood examination showed a moderate degree of secondary anemia; 78 per cent. hemoglobin; 4,200,000 red cells, with 16 per cent. postvital reticulation, and a normal differential count. Auto-agglutination tests were negative. Two fragility tests before operation showed a minimum resistance of 0.48 to 0.50 per cent., and a maximum resistance of 0.30 to 0.35 per cent.

Splenectomy was performed on November 23, 1915, at the Roosevelt Hospital. The gallbladder and ducts, liver, stomach and pancreas were normal. The spleen measured 17 by 10 by 7 cm. and weighed 800 gm. It was slightly adherent along the posterior border and at the upper pole, but delivered without great difficulty and the operation was well borne.

The jaundice began to fade within two or three days and was entirely gone by the tenth day. The patient has remained well and entirely free from jaundice since the operation.

The spleen was rather soft and flabby, the cut surface was dark red and rather granular, and the trabeculations stood out prominently. Microscopically, there was no increase of fibrous tissue; the follicles were of varying size, some having disappeared. There was marked interstitial suffusion with red blood cells. The changes in the pathology of the spleens removed have been fairly uniform and correspond with those found in previous reports. There is marked interstitial suffusion of red blood cells, dilatation of splenic sinuses, loss of follicles and absence of germinal centers. There is practically no increase of fibrous tissue.

Six days after splenectomy the fragility test showed a minimum resistance of 0.50 per cent. and a maximum of 0.35 per cent., that is, there was no change following the operation. On December 20, four weeks after operation, the fragility test was the same, reticulation of the red cells was normal (0.5 per cent.), and urobilin and urobilinogen had disappeared from the urine. The patient gained in weight and resumed his work four weeks after the operation.

This case illustrates the acquired type of hemolytic jaundice, evidently dependent on the splenic changes and on no previous etiologic factor that could be determined.

The fragility of the red blood cells in this case was slight, and was practically unchanged after splenectomy.

The third case was of the congenital, nonfamilial type, and the patient was operated on by my colleague, Dr. James I. Russell, to whom I am indebted for permission to include it in this report. Only a brief abstract of the history will be given, as the case was presented to the New York Surgical Society and reported in its *Proceedings*.

The patient was a man, 20 years of age, transferred from the medical service to the second surgical division on July 6, 1915 (history No. 6546).

He had been jaundiced since birth, the icterus increasing up to 5 years of age, after which time it was stationary. There was no history of jaundice in the family. He presented the following symptoms: Icterus of a fairly marked degree, nonobstructive in type, of a lemon yellow hue, secondary anemia of a mild type; 74 per cent. hemoglobin, 5,200,000 red cells; red cell fragility not increased, the minimum resistance being 0.45 per cent., and the maximum 0.30 per cent., remaining unchanged after operation; reticulated red cells, vital stain, 8 per cent.; splenomegaly of a marked degree, the spleen weighing 1,143 gm.

Splenectomy was performed on July 10, 1915, and was followed by complete disappearance of the jaundice and a prompt recovery.

In addition to the three cases cited, I have recently performed cholecystectomy for calculi with chronic cholecystitis in a typical case of congenital hemolytic jaundice of the familial type, with marked splenomegaly. Both the patient and her physician were unwilling to have splenectomy performed at that time, though recognizing the possible necessity of such a procedure in the future.

That hemolytic jaundice is not uncommon and that it can be cured by splenectomy are now well recognized, and recent contributions to the literature are emphasizing its importance and bringing it more and more to the attention of the profession.

INDICATIONS FOR SPLENECTOMY IN CERTAIN CHRONIC BLOOD DISORDERS

THE TECHNIC OF THE OPERATION *

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Splenectomy has already proved a curative measure in certain diseases associated with definite blood changes, and the operation has recently been advocated for other diseases which appear to be more or less closely related to those in which the spleen is now the known causative factor. The basis on which splenectomy has been suggested in these heretofore incurable conditions will be more clearly understood if we briefly review the development which has resulted in the present situation.

Splenic anemia offers the most familiar example of the therapeutic value of splenectomy. Sufficient time has now elapsed since the earlier operations for this disease to prove that the results of splenectomy in early or in moderately advanced cases are not only excellent, but permanent. The most interesting characteristic of the disease as concerns the purpose of this paper is its tendency to develop cirrhotic changes in the liver. In fact, Banti described the disease as it appeared in its later stages when it is associated with marked cirrhosis and with ascites. In such a stage, from a diagnostic standpoint, it is often difficult and sometimes impossible to determine in a given case whether the condition is the result of a true splenic anemia or of a primary liver cirrhosis associated with a large spleen. Experience has shown that in the very late stages of splenic anemia definite improvement following splenectomy cannot be expected, yet it is also true that a moderate cirrhosis, even associated with ascites, has been present in some cases in which excellent results have been obtained. This fact, therefore, with the probability that certain of the cases which have been classified as true splenic anemias and operation performed on that diagnosis, were in reality cases of primary cirrhosis, was responsible for the sugges-

* Read before the joint meeting of the Section on Practice of Medicine and the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

tion that splenectomy might prove of value in arresting the progress of selected types of hepatic cirrhosis.

The interdependence of spleen and liver is not clearly understood, yet there is ample evidence to show that some of the most important functions of the liver, for example, its hemolytic power, are more or less controlled by the spleen. Certain pathologic conditions in the liver, therefore, are the result of overactivity, which may in turn be due to overstimulation by the spleen.

During the last two years, with this theory as a basis, selected patients with primary hepatic cirrhosis have been splenectomized. Two, at least, of four such cases of our own gave promise that the removal of the spleen might stop or retard the progress of the disease, but we are not yet in a position to state the value of such a procedure.

The success of splenectomy in splenic anemia, with associated splenomegaly and severe anemia, has led to splenectomy in other diseases in which splenomegaly and anemia are characteristics. One of the most interesting of these is the syphilitic spleen; we have seen good results follow splenectomy in three cases of this form of syphilis. The prominent clinical features of the cases in which we believed operation to be indicated were (1) splenomegaly, (2) a history of syphilis not responding to treatment, (3) positive Wassermanns, (4) anemia. It is important to note that previous to operation a negative Wassermann could be obtained under appropriate treatment, but the reaction became positive as soon as treatment was discontinued. All these patients had gummas in the liver, and in the spleens removed the spirochete could be demonstrated in large numbers. It was also a clinical observation that although the virulence of the infection could be more or less controlled by antisyphilitic treatment, it was not eradicated.

From the foregoing facts, the conclusion may be drawn that the spleen picks up the spirochetes and harbors them, and this conclusion is supported by the surgical observation that removal of the spleen, followed by antisyphilitic treatment, results in prompt and permanent relief.

The influence which the spleen exercises on the hemolytic function of the liver and spleen is most strikingly illustrated in the effect of splenectomy in hemolytic jaundice. Although this disease is a problem from an etiologic standpoint, the most important therapeutic fact is that splenectomy is followed by prompt, complete and permanent cure. The rapid disappearance of the icterus, which is the most obvious symptom of the disease, is an amazing clinical result; the anemia, which is sometimes severe, is also rapidly corrected.

The remarkable results following splenectomy in splenic anemia and hemolytic jaundice, particularly the latter, appear to have provided the basis on which Eppinger and others have suggested that similar surgical treatment might prove of value in pernicious anemia. It is important, therefore, that the relationship of splenectomy to these other diseases should be borne in mind. The argument becomes more forceful if it is possible to establish similarities between any one of these diseases for which splenectomy is curative, and pernicious anemia. Many of the features of hemolytic jaundice appear to have a counterpart in pernicious anemia, and, in fact, Eppinger believes that the chief, and possibly the only, difference between hemolytic jaundice and pernicious anemia is that in the former the bone marrow is able to compensate for the increased blood destruction, whereas in pernicious anemia it soon loses this power, and the disease eventually is dependent on a bone marrow disability.

It would, therefore, appear as a logical sequence that since splenectomy has proved a specific in hemolytic jaundice, it would sooner or later be advocated in pernicious anemia. Although the first operations for this disease were performed, both abroad and in this country, about the same time (1913), to Eppinger must be given special credit for efforts to establish a scientific basis for the surgical treatment. While the surgical therapeusis of pernicious anemia can be considered as on trial, it presents features of much interest and promise, and splenectomy is now being performed with a frequency which should soon permit definite and decisive deductions.

It must, of course, be primarily recognized that any new therapeusis in a disease of the character of pernicious anemia must be subjected to a particularly thorough trial. The extreme chronicity of the disease in its usual course, and the fact that, with or without treatment, remissions occur, during which the patient is much improved and the blood may even revert to normal, stamps any conclusions based on the early results of operation as premature. This much, however, can be said, that immediate improvement follows splenectomy more consistently and promptly than any treatment heretofore used.

It is on the ultimate results, however, which are as yet insufficient, that the final decision as to the real efficiency of splenectomy in pernicious anemia must rest. There is at the present time, therefore, decided uncertainty as to any superior therapeutic value of a permanent character possessed by splenectomy. It is also true that pernicious anemia has thus far been an incurable disease, ranking in fatality with cancer and less amenable to successful treatment. The certainty of the ultimate prognosis has been the outstanding feature of our knowledge of the disease, and the doomed patient could hope only that the disease would be slowly progressive and not associated with great physical disability.

The pathologic picture which Eppinger has described as distinctive of the spleen in pernicious anemia is as follows: The pulp areas in the spleen, and only these, are gorged with blood. Eppinger explains this engorgement as a direct result of an abnormal condition of the central artery. It has been shown that the entire wall of this artery is greatly thickened, and that the greatest change takes place in the media. The theory is, briefly, that sufficient obstruction results to force the flow of blood through the capillaries into the pulp areas, where the erythrocytes are destroyed. If a constant pathology can be demonstrated in the spleen in pernicious anemia, it will be a great advance toward the rational treatment of the disease.

While it cannot be held that the basis on which Eppinger and his followers have endeavored to establish the surgical treatment of the disease has been confirmed or even well supported by others, it is not essential, nor is it good judgment, to postpone surgical treatment of the disease until an acceptable basis for such treatment is generally recognized.

The hemolytic nature of pernicious anemia is demonstrated by the increased amounts of urobilin and urobilinogen excreted. It has been assumed, and there is much clinical and experimental evidence to show,

that this hyperhemolysis is due to a hypersplenism, and interesting investigations are now being conducted, after the suggestion of Schneider, to determine the exact quantity of these hemolytic products by obtaining them immediately with a duodenal tube on their exit from the liver. Giffin has shown, by the records of the urobilin and urobilinogen estimation in a series of cases of pernicious anemia, that the values appeared to run more or less parallel to the degree of icterus, and that in some cases at least there was a marked fall in the value of the blood-derived pigments after splenectomy. It is possible that from this method information of at least prognostic value may be derived. Giffin has suggested the very interesting possibility that the relation of hemolysis, as shown by the estimation of the blood-derived pigments, and the bone marrow disability, as illustrated by the blood picture, may result in deductions of decided value.

The effect of splenectomy in other diseases being the primary basis for the operation in pernicious anemia, the further indications must be mainly based on operative results, and as early results only are as yet available, such indications are presented with reservation and will undoubtedly be subject to further modification.

INDICATIONS FOR OPERATION

Size of Spleen.—It would appear that the larger the spleen the better the prospects that splenectomy will prove of benefit. It may be assumed in this disease that oversize means overactivity, and it has certainly been true, in our own experience, that the most consistently promising results following splenectomy have occurred when the spleen showed the greatest enlargement. However, good immediate results have been obtained also when little or no enlargement was present. The palpability of the spleen, therefore, has been looked on as one of the first considerations in discussing the advisability of splenectomy. Exclusive of three cases in which the spleens were very large, the spleens in a series of thirty-seven of our cases averaged 400 gm., as compared with the normal of about 195 gm. It should be remembered that any estimation of the size of the spleen before it has become actually palpable is rather speculative. W. J. Mayo early pointed out that frequently in exploring the spleen in the course of abdominal operations, and comparing its actual size with that noted in the clinical records, it is found that clinical records are not consistently correct and as a rule are accurate only when the organ is palpable.

Icteric Types of the Disease.—The very intimate relationship between the spleen and the acholuric icterus as seen in pernicious anemia, hemolytic jaundice and in hypertrophic cirrhosis is proved both by operative results and experimental studies. The remarkably rapid, complete and permanent disappearance of the jaundice in hemolytic jaundice, for example, following splenectomy is sufficient evidence of the splenic factor. Experimentally, it is very difficult to produce toxic jaundice in spleenless dogs by those poisons which readily produce it in the normal dog. In spleenless dogs under the administration of such poisons (particularly toluylendiamin) the bile remains thin and green, while in nonsplenectomized dogs it becomes viscid. Stadelmann was the first to attribute such acholuric jaundice to this thickening of the bile, which delays, by very reason of its viscosity, its own passage through the finer bile capillaries. A marked icteric discoloration in the skin in pernicious anemia may be taken as an indication that the spleen is to a large degree responsible for the abnormal blood destruction feature in the disease.

Response to Transfusion.—The transfusion of blood, particularly of small quantities at frequent intervals, has for some time been recognized as valuable treatment, though only of temporary character, in pernicious anemia. It has recently become evident, however, that transfusion is not only an excellent therapeutic expedient, but that in the immediate response following the procedure, it is of distinct prognostic value in foretelling the probable results of splenectomy. Definite improvement after transfusion is a strong indication for splenectomy, but when no benefit occurs from repeated transfusions, splenectomy will probably also prove futile, though the reverse of both these indications is occasionally true. Transfusion seems to serve a double purpose, as does the ligation of the blood supply in exophthalmic goiter, by (1) improving the condition of the patient, and by (2) predicting rather accurately the effect of the major operation on the disease.

Duration of the Disease.—Although in our own experience satisfactory results may be obtained when the disease has been of long standing, we believe the results are not as favorable as those in cases in which the disease has existed a short time.

Radical measures to interrupt the progress of the disease while it is yet in an early stage seem logical. Although there is little positive knowledge as to the reason for the permanent disability of the bone marrow, it is probable that it is constantly overstimulated in an effort to meet the abnormal demands made on it, and also suffering from the influence of the hemolytic agent or some other toxin.

In pernicious anemia, like exophthalmic goiter, the course of the disease tends to be interrupted by periods of comparatively good health and normal bodily functions. Each recurrence, however, further damages the organs which are affected by the toxin, and although with the interruption of the process in its early stages there may be complete restoration to health, sooner or later, regardless of the further course of the disease, permanent injury results.

The ability of man to develop other hematopoietic centers, when the normal source of the supply of blood corpuscles, the bone marrow, is under great stress, is well known. Such centers have been demonstrated in the spleen, the liver and lymph nodes. Whether in pernicious anemia the augmentation of the hematopoietic functions is simply compensatory by reason of the increased blood destruction of the disease, or whether the bone marrow, under the influence of some specific toxin, is primarily diseased, so that immature red cells are put into the circulation, is as yet problematic. It is more than possible that pernicious anemia could be cured in its inception, like cancer, if treated properly; when it is well established, a vicious circle is produced and a permanently disabled hematopoietic system is added to the primary etiologic factor or factors. The question of permanent cure in pernicious anemia, therefore, may ultimately depend, not only on interrupting the progress of the disease by removing what appears to be the primary factor, but also to a greater extent on our ability to restore the bone marrow and other hematopoietic structures to their normal physiologic functions. It is to be hoped that earlier recognition of pernicious anemia will result in earlier splenectomy.

Activity of the Disease.—The activity of the disease is an important consideration in discussing the advisability of operation. Splenectomy should be undertaken with hesitation in acute stages of pernicious anemia and especially with a falling blood picture. The operation cannot at the present time be advocated when cord changes and other permanent pathologic processes mark the terminal stages of the disease. Moreover, as already suggested, if it is not possible to tide a patient over the critical periods by transfusion, splenectomy is contraindicated. Definite statements based on the qualitative blood picture cannot be made, but if the hemoglobin is under 25 per cent. and cannot be raised, operative treatment is of considerable risk and has doubtful results.

The extent of the disability of the patient must of course be carefully considered. If a patient with every evidence of the disease is able to carry on his usual occupation, splenectomy cannot be strongly advocated, yet these may be the very patients in whom good results may be obtained. The operation may be urged more legitimately when the patient is unable to do his work or is a chronic invalid.

A positive diagnosis of pernicious anemia having been made and the advisability of splenectomy established, it is important that the patient and his family be correctly informed as to the purpose and the status of splenectomy.

Splenectomy we have found of less technical difficulty in pernicious anemia than in any other disease or condition. An incision toward the outer edge of the left rectus extending above to about one inch from the costal margin and below to the level of the umbilicus is satisfactory. An abdominal exploration should first be made, especially in view of the frequent complications of liver and gallbladder met with in those diseases for which splenectomy is advocated.

The dislocation of the spleen from its position against the diaphragm and against the left kidney is not, as a rule, complicated by formidable adhesions in pernicious anemia; nevertheless, the operation is facilitated and the minor oozing points are controlled by the introduction of a large abdominal pack against the newly exposed surface. In the actual removal of the spleen it must always be borne in mind that the stomach and pancreas are in close anatomic relationship. The fundus of the stomach is in such immediate apposition to the gastric surface of the spleen that its wall may be injured if the gastrosplenic omentum at this point is not divided with particular care.

The tail of the pancreas does not bear a constant relationship to the splenic pedicle. In some instances it lies in front; in others behind, and it may extend along the pedicle until its tip rests in the hilus of the spleen. It is quite evident, in certain cases, that the tip of the pancreas must be dislodged from its position if the pedicle is to be ligated without injury, although such a condition is relatively unusual in pernicious anemia. The pedicle is rarely of sufficient size to present any difficulties in its control. It is comparatively easy to isolate the artery and the veins and ligate them independently. Although it has been advised that the artery should be ligated first in order that the spleen may empty itself of its blood, and although I have done this in some cases, I have never been able to observe any difference in the convalescence or the effect of splenectomy on these patients, as compared with those in whom the artery and veins were ligated at the same time.

All bleeding points having been securely controlled, the pack is removed and the diaphragmatic surface inspected.

SUMMARY

We believe that splenectomy should be considered in every case of pernicious anemia in which the diagnosis has been established and all possible etiologic factors which might be independently remedied have been excluded. The failure of other means to combat the disease, the previous fatal prognosis, and the low operative mortality are strong arguments in favor of splenectomy. Contraindications must be positive and adequate. Granting this, however, we must be cautioned by our imperfect knowledge of the surgical indications. The conservative selection of cases is therefore advisable.

PERNICIOUS ANEMIA TREATED BY SPLENECTOMY AND SYSTEMATIC, OFTEN-REPEATED TRANSFUSION OF BLOOD

TRANSFUSION IN BENZOL POISONING *

ROY D. McCLURE, M.D.
DETROIT

Transfusion of blood in cases of pernicious anemia is perhaps the first remedy that suggests itself for the treatment of the malady. It probably was tried long before it is recorded in the literature. Since the newer ways of transfusion with syringes and the citrate method have so simplified the operation, it has been tried innumerable times, but with only indifferent success. The best it has accomplished has been to initiate a remission in the course of the disease. There are many reasons why these transfusions have not been of more value. Chief among these is the lack of systematic treatment. Usually about as much good is accomplished by a single transfusion as is accomplished by a single inunction of mercury in the treatment of syphilis. Discredit has also been incurred by using blood which has not stood the proper tests and which is not only unsuitable but is often positively harmful and which may result in disaster.

The practice of transfusion of blood since it was first performed in man in 1666 by Jeane Baptise Denys, professor of philosophy and mathematics in the Royal University in Paris and physician to Louis XIV, and by his teacher Dr. Lower[1] in London, who had developed the method by his work with his experiments on animals in 1660, has passed through periods of great disrepute. At first it fell into disfavor because the blood of animals, dogs, sheep and calves was used and there were probably deaths from anaphylaxis. The road to safe transfusion was not made possible until Landois[2] in Greifswald in 1870 discovered that the blood of one man was not always compatible with the blood of others, though I believe he never explained it, yet he did show that the serum of one animal might dissolve the red blood cells of another animal. It remained for Moss[3] in this coun-

* From the Surgical Clinic of Dr. W. S. Halsted, Johns Hopkins Hospital.
† Read before the joint meeting of the Section on Practice of Medicine and the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, 1916.

1. Philosophical Transactions and Collections of Medical and Philological Papers, John Lowthrop, 1731.
2. Landois: Die Transfusion des Blutes, 1875.
3. Moss: Bull. Johns Hopkins Hosp., 1910, xxi, 63.

try and for Landsteiner[4] and Jansky[5] abroad to show that the blood from two individuals may not mix well, due to the following facts:

1. That the red corpuscles of one or of each may be clumped by the serum of the other.

2. That corpuscles clumped in this way may be hemolyzed as well.

3. That all human beings soon after birth may be grouped into four distinct classes, depending on the ability of their serum to agglutinate the red corpuscles of members of the other groups and on the susceptibility of their corpuscles to agglutination by the serum of members of the other groups.

TABLE 1.—RESULTS OF TRANSFUSIONS IN CASE OF SECONDARY ANEMIA FROM BENZOL POISONING (SUTURE METHOD)

No.	Date, 1914	Hemoglobin, per Cent.			Red Blood Cells		
		Before	After	Increase	Before	After	Increase
1	5/ 3	20	38	18	1,296,000	1,680,000	454,000
2*	5/17	28	48	20	1,117,000	1,971,000	864,000
3	5/23	20	40	20	910,000	1,856,000	946,000
4†	5/31	11	42	31	0	0	
5	6/13	48	65	17	3,476,000	4,528,000	1,052,000

* Defibrinated blood.
† Patient bleeding, comatose.

In the selection of a donor little attention for a time was paid to the fact that the serum of an individual in one group hemolyzed and agglutinated the cells of a person in another group. Some men doing transfusions wrote as late as 1912 that the action of one blood on another was not necessarily the same in vitro as in vivo, and they rather scoffed at these tests. This attitude could only do harm to the reputation of transfusion as a therapeutic measure. I know that deaths have occurred as the result of transfusion when the tests were ignored or improperly performed. Even when the tests were properly performed and the bloods reported compatible, we have had one case of severe hemolysis. On returning to the laboratory tests we found that agglutination was present at the end of one hour, but we had accepted the report as favorable at the end of a half hour. Therefore, we concluded that the report of compatibility can not be safely made under an hour.

In an extended series Moss has found that the relative frequency of the groups is as follows: Group 1, 8 per cent.; Group 2, 36 per cent.; Group 3, 9 per cent.; and Group 4, 47 per cent. Gorham and Lisser[6] found that the serums of the various groups differed in the rapidity with which they brought about agglutination of the corpuscles of the other groups. Thus Group 4 required five minutes or less, Group 2 often fifteen minutes to half an hour, and Group 3 still longer for positive identification.

The selection of a proper donor is therefore a very important matter, and often rather difficult if the patient belongs in one of the rarer groups, 1 or 3. It is also imperative that transmissible diseases be ruled out by history, blood examination, Wassermann, etc. I wish to report here for the first time the transmission of syphilis by transfusion in a case of pernicious anemia. The donor was a close relative of the patient and before giving his blood denied having syphilis and also denied exposure to infection. Less than six weeks after this transfusion the patient returned with the most virulent syphilitic rash and mucous ulcers. At the same time the secondary eruption appeared in the donor. It then developed that the donor had a primary sore at the time he gave the blood. Malaria was transferred in one of the early cases by a transfusion of defibrinated blood. It was in the quiescent stage in the donor, but flared up in the recipient.

Transfusion has usually been carried on in cases of pernicious anemia in a very desultory or sporadic fashion, and as we have pointed out, often without proper donor being selected, consequently it was soon regarded as of little value in this disease.

Our attention was first drawn to the great value of repeated transfusions, in 1914, in the treatment of benzol poisoning.

On the service of Dr. L. F. Barker at Johns Hopkins Hospital in 1909 there were admitted the first of a series of cases of benzol poisoning. The patients were girls employed in a canning factory in Baltimore. Benzol (benzene, C_6H_6) was used in dissolving rubber and the fumes resulted in the poisoning of the workers. The symptoms are a severe purpura hemorrhagica with a severe anemia of the aplastic type. Several transfusions were performed among these cases, but as there was only temporary improvement, if any, the procedure was regarded as of little value. Several patients died soon after admission. The following case we report, as the result of each transfusion was so striking, one of the operations so plainly saving her from immediate death. Our previous results had been so discouraging, as the improvement of a single transfusion was so temporary, and we were ready to give up. The family of the patient, however, saw the enormous immediate benefit of each transfusion and insisted that we continue with this treatment. They produced the donors, so we always had suitable blood. Much to the surprise of all of us she soon ceased to require transfusion and made a complete recovery.

S. H., a woman, aged 31 years, worker in a canning factory, admitted to the hospital May 1, 1914, complained of bleeding from the nose and mouth. A diagnosis of benzol poisoning and secondary anemia was made. Her family history was unimportant. Her present illness began with an onset seven weeks before entrance (early part of April, 1914), with a feeling of weakness and bleeding from the nose. The hemorrhage usually lasted from one-half to two hours. Black and blue spots appeared over the body, followed by shortness of breath, bleeding from the gums and loss of appetite.

TABLE 2.—RESULT OF TRANSFUSIONS IN SEVENTEEN CASES OF PERNICIOUS ANEMIA, SIXTY-FOUR TRANSFUSIONS BEING MADE WITH NO DEATHS*

Result	Number	Per Cent.
Beneficial	34	53
No benefit	23	35
Harmful	7	10
Severe reactions	7	10
Slight reactions	12	19
Chill	7	10
Dilated heart 24 hr. after transfusion	1	1½
Jaundiced	1	1½
Hemoglobinuria	3	4½
Temp. elevation over 101	12	19
Skin eruptions	7	10

* Splenectomy was performed in six cases.

On examination the woman was found to be pale and obese. There was bleeding from the margins of the gums. There was no general glandular enlargement. The lungs were clear, the heart slightly enlarged. A systolic blow was perceptible at the base. Numerous purpuric spots were distributed over the body, and there was slight edema of the extremities.

On May 2, 1914, the red blood cell count was 1,460,000; white blood cell, 1,110; hemoglobin 25 per cent.; polymorpho-

4. Landsteiner: Wien. klin. Wchnschr., 1901, xiv, 1132.
5. Jansky: Klin. zborn., 1907, No. 2; abstr., Jahresb. f. Neurol. u. Psychol., 1907.
6. Gorham and Lisser: Am. Jour. Med. Sc., 1912, cxliv, 103.

nuclears, 40 per cent.; mononuclears, 37 per cent.; transitionals, 15 per cent.; no nucleated red blood cells; no myelocytes. Platelets were almost absent. Bleeding time fourteen and one-half minutes; normal time is one-half to two minutes.

Transfusions were done by the Carrel end-to-end method. The results are shown in Table 1.

After each of the first three transfusions she rapidly lost what she had gained and unfortunately another transfusion was not done until she had slipped back. The fourth transfusion was all but too late. A massive transfusion was done, probably 1,500 c.c. or more of blood being given, and there was a great rise in hemoglobin. (We were still using the end-to-end suture method, so no measurement of the quantity of blood could be made.) Normoblasts and nucleated red cells made their appearance and after the next transfusion (donor a negro man) the patient made an uneventful recovery, and was discharged from the hospital July 26, 1914.

TABLE 1.—EFFECT OF TRANSFUSIONS ON THE PATIENT T. A., CASE 1

No.	Date, 1915	Amt. C.c.	Hemoglobin, per Cent.			Red Blood Cells		
			Before	After	Change	Before	After	Change
1	3/ 9	700	25	33	8	1,428,000	1,920,000	492,000
2	3/26	750	54	67	13	2,128,000	2,440,000	312,000
3	7/ 3	650	29	40	11	840,000	1,656,000	816,000
4	7/10	675	32	41	9	1,296,000	2,128,000	832,000
5*	7/24	700	35	?	?	1,884,000*	?	?
6	8/ 8	700	29	45	16	?	?	?
7	8/27	700	40	60	20	1,888,000	3,220,000	1,332,000
8	9/ 1	692	50	60	10	1,960,000	3,088,000	1,128,000
9	9/ 3	675	60	70	10	3,088,000	3,144,000	56,000
10	9/ 9	675	60	65	5	2,424,000	?	?
11	9/11	880	65	75	10	2,424,000	3,688,000	1,264,000
12	9/23	770	80	85	5	3,632,000	4,432,000	800,000
13	10/ 7	675	80	90	10	4,928,000	5,280,000	352,000

* Splenectomy was performed following fifth transfusion.

Jan. 17, 1916, the patient has remained well, the hemoglobin being 95 per cent.; red blood cells, 4,272,000.

This led us to believe that perhaps steady use of carefully planned transfusions persistently used to prevent the anemia and its results might be of benefit in pernicious anemia. We advocate, too, splenectomy.

Since Eppinger in May, 1913, first called attention to the very beneficial effect of splenectomy in pernicious anemia, it has been widely performed. American surgeons have reported often great improvement, but probably no cure. It is unnecessary to discuss it further after the papers of this symposium. Eppinger regards splenectomy as the most important measure in the treatment of pernicious anemia.

Table 2 shows a brief résumé of our transfusions in pernicious anemia. As will be seen, splenectomy was carried out in only six of these cases, three by Dr. Finney and three by myself.

The transfusions that resulted harmfully or were of no benefit we feel due to improper matching of the blood. This resulted in still greater care in the selection of donors. In the earlier cases, little benefit resulted from the fact that only a single transfusion was done. We will report only three cases here as there is not space for all.

CASE 1.—T. A., aged 38, was admitted to the hospital Feb. 22, 1915, complaining of progressive weakness. A diagnosis of pernicious anemia and pyorrhea alveolaris was made. The family and personal history were unimportant. The present illness had its onset in June, 1914, with weakness, followed by loss of appetite, constipation, nausea and vomiting, and a loss of weight of 24 pounds. There was dyspnea but no nervous system symptoms.

Blood examination made Feb. 22, 1915, showed red blood cells, 1,584,000; white blood cells, 4,560; hemoglobin, 32 per cent. The color index was high; the differential count, 70 per cent., polymorphonuclears, mononuclears, 25 per cent., 1 nucleated red blood cell.

On Jan. 17, 1916, blood examination showed hemoglobin 93 per cent.; red blood cells 3,728,000; polymorphonuclears 77 per cent.; small mononuclears 10 per cent.

CASE 2.—J. B., a woman, aged 43, was admitted to the hospital, Sept. 10, 1915, complaining of weakness, shortness of breath, and pallor. A diagnosis of pernicious anemia was made. The family history was negative. The personal history of the patient showed that the bowels were regular, and that she had had two miscarriages. Otherwise the history was unimportant.

The patient had had cystitis for two years, appetite poor, with a burning sensation of tongue and mouth. The temperature was from 99 to 101. There had been some dizziness for six months. A roaring sensation in ears had been noticed for two months. There was slight edema.

On examination of the patient the mucous membranes were found pale; the blood pressure was 150 mm. of mercury systolic, 80 diastolic; the temperature was 100.4. There was an impaired percussion note at the apexes of the lungs, but no râles. The heart was slightly enlarged. A systolic murmur was heard at the apex. The liver was not enlarged and the spleen could not be felt. There was no general glandular enlargement. The reflexes were normal. The stools were negative.

Blood examination showed hemoglobin 27 per cent.; red blood cells 1,136,000; white blood cells 3,560; polymorphonuclears, 66 per cent.; eosinophils, 0.5 per cent.; basophils, 0.5 per cent.; small mononuclears, 27.5 per cent.; large mononuclears, 3 per cent.; transitionals, 1 per cent.; myelocytes, 1 per cent.; myeloblasts, 0.5 per cent.

On September 12 the hemoglobin was 29 per cent.; white blood cells, 2,000; red blood cells, 944,000. There were fresh hemorrhages in both eye grounds. The Wassermann was negative. Gastric analysis showed hydrochloric acid deficit 8 per cent.; total hydrochloric acid 2 per cent.

CASE 3.—H. P., a widow, white, aged 62, was admitted to the hospital Jan. 3, 1916, complaining of weakness and lack of blood. Her family and personal history were unimportant. Previous to her present illness she had always been healthy and strong. The onset occurred in January, 1914. There was increased frequency of urination. A few weeks later there was weakness of the knees, progressive shortness of breath, and for three weeks, pain over the heart. There had been no fainting or giddy spells; she had lost 37½ pounds in weight.

TABLE 4.—EFFECT OF TRANSFUSIONS ON THE PATIENT J. B., CASE 2

No.	Date, 1915-16	Amt. C.c.	Hemoglobin, per Cent.			Red Blood Cells		
			Before	After	Change	Before	After	Change
1	9/25	800	20	35	15	680,000	1,520,000	840,000
2	9/30	900	35	45	10	1,664,000	2,048,000	384,000
3	10/ 9	900	55	76	21	2,240,000	3,520,000	1,280,000
4	10/16	900	76	85	9	2,432,000	4,176,000	1,744,000
5	10/24	20	85	52	33*	4,176,000	2,672,000	1,504,000*
6	10/30	800	47	62	15	3,624,000	4,000,000	376,000
7	12/11	788	22	40	18	648,000	2,158,000	1,510,000
8	12/14	600	42	55	13	2,450,000	3,158,000	708,000
9	12/18	800	?	?	?	?	?	?
10	12/21	280	...	48	...	.....	3,000,000	?
11	12/30	550	53	48	5*	1,900,000	?	?
12	1/22	500	51	70	19	3,368,000	3,648,000	280,000
13	1/12	660	74	78	4	3,792,000	?	?
14	1/14	270	78	82	4	?	?	?

* Lost, due to hemolysis.

Examination showed a woman of large frame, with dyspnea on slight exertion. There was a lemon color to the skin, and evidence of recent loss of weight; no general glandular enlargement; teeth practically all gone; chest symmetrical; costal angle almost straight. No râles; region of cardiac dulness extended 4.5 cm. to the right and 11 cm. to the left of the midline. There was a systolic murmur at the base of the heart and a diastolic murmur over the vessels of the neck. The blood pressure was 118 mm. of mercury systolic, 60 diastolic. The liver was not enlarged, and the spleen could not be felt. The reflexes were difficult to obtain. There were no sensory

disturbances. Rectal examination was negative. Red blood cells were 936,000; white blood cells, 5,440; hemoglobin 26 per cent.; polymorphonuclears 50 per cent.; eosinophils, 0.4 per cent.; basophils, 0.4 per cent.; small mononuclears, 28.8 per cent.; large mononuclears, 2.8 per cent.; transitionals 0.8 per cent.; myelocytes 13.6 per cent.; unclassified, 3.2 per cent.; red blood cells January 7, 1,088,000; hemoglobin 25 per cent.; Gastric analysis showed no free hydrochlorates; stool examination was negative; eye grounds normal except for pallor of the disks. January 10, red blood cells 1,288,000; hemoglobin 23 per cent.

TABLE 5.—EFFECT OF TRANSFUSIONS ON THE PATIENT H. P., CASE 3

No.	Date, 1916	Amt. C.c.	Hemoglobin, per Cent.			Red Blood Cells		
			Before	After	Change	Before	After	Change
					Loss			
1	1/12	200	26	22	3	1,224,000	1,440,000	216,000
2	1/21	300	21	26	5	1,440,000	1,448,000	8,000
3	1/24	682	29	36	7	2,352,000	2,608,000	256,000
4	1/26	640	36	50	14	2,352,000	2,416,000	64,000
5	2/ 2	620	50	55	5	2,416,000	2,434,000	18,000
6	2/ 7	600	54	65	11	3,040,000	4,680,000	1,640,000
7	2/19*	450	65	?	?	2,482,000	2,726,000	244,000
8	2/26	360	63	?	?	3,072,000	?	?
9	3/ 6	500	70	76	6	3,752,000	3,824,000	72,000
10	3/13	450	71	86	15	3,584,000	4,736,000	1,152,000

* Splenectomy was performed February 12.

The repeated systematic transfusion has been carried out only during the past year. The results, however, have been so encouraging that we feel that the life of a patient with pernicious anemia may be indefinitely prolonged if the spleen is removed as soon as the patient is in condition to stand the operation, and sometimes we have to transfuse several times before splenectomy.

After the spleen is removed if there is not a rapid improvement in the blood picture, we would advocate transfusion until the hemoglobin is as high as 90 per cent. or more, never allowing it to fall below 75 per cent. As remissions often last several months or a year, not many transfusions may be required. It is well known that anemia so reduces the resistance of the body to infections that it is often an easy prey. Thus can the usual secondary causes of death in pernicious anemia be avoided, and who can tell but that within a few years of persistent transfusions the primary cause, whatever it may be, of pernicious anemia may lose its force and perhaps the disease be cured.

Henry Ford Hospital.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. LEE, MINOT AND VINCENT, KRUMBHAAR, MILLER, PECK, BALFOUR AND MC CLURE

DR. FRANK SMITHIES, Chicago: During the past two and a half years in the clinics of Drs. Percy and Ochsner we have treated twenty-seven cases of pernicious anemia by multiple transfusion of whole blood and splenectomy. Our cases have strongly impressed on us the value of the observations of William Hunter with respect to the toxic or even the infectious nature of the ailment. Just what effect on the hematopoietic tissues may be produced by a periodically recurring low grade infection it is not at present possible to fully state. Of peculiar significance, in my opinion, is the fact that in practically all of our cases, infective foci were demonstrable. The removed spleen showed evidences of chronic splenitis and perisplenitis, indicating that a toxic or infective process had been chronically going on. It has not been possible to culture organisms from the blood or the tissues. It would seem that work similar to that which Rosenow has carried out in tissue culture will at some time demonstrate organisms which at present escape detection. The term "treatment by splenectomy" is, I think, misleading and incomplete. The splenectomy is merely one part of the treatment and frequently a part of the treatment which may perhaps later on be proved to be the least essential. The routine of treatment which we have emphasized is: multiple, massive transfusions of whole blood, eradication of local foci of infection wherever such may exist, and lastly, laparotomy for removal of the spleen and other tissues evidencing chronic subinfection.

Multiple blood transfusions supply protective antibodies and enable the patient to get rid of the secondary changes which have been going on in the various organs. They improve the blood in quantity and quality. They thus bring the patient to his splenectomy as a fair to good operative risk. During the multiple blood transfusion the patient can be treated with regard to self-evident infection. The operative procedure then becomes relatively safe. Of the twenty-seven cases operated on by Dr. Percy there were but two operative deaths, and one other death within three months following splenectomy. I attribute this rather remarkable experience to the fact that the patients were carefully prepared for the major operation. I attribute many of the poor results following splenectomy in pernicious anemia to the patient's being rushed into splenectomy before he has been properly prepared as a surgical risk. Ninety per cent. of the cases which I observed showed subinfections in the gallbladder or appendix and all showed evidences of chronic infection in the spleen.

The effects on the blood in the cases I have studied are: In cases that have run from four to twenty-seven months following our treatment there has been an average hemoglobin gain of 43 per cent.; an average gain of red cells of 3,322,000, and this gain has in general been well maintained. Study of blood smears shows an absence or diminution of nucleated red blood cells of 94 per cent. There was a decrease in the color index in 68 per cent. There was a permanent increase in the leukocytes in 88 per cent.; a decrease in coagulation time in 66 per cent.; a decrease in polychromatophilia in 56 per cent., and the establishment of a relative polymorphonuclear leukocytosis in 61 per cent.; a reduction, relatively, in lymphocytosis in 55 per cent., and a definitely demonstrable gain in blood platelets in 61 per cent. Patients frequently improved, clinically, out of all proportion to the apparent improvement in the blood picture. The permanence of these results no one can at present state. One patient treated twenty-seven months ago is in most excellent shape after having been a useless invalid for more than two years previously.

DR. BETH VINCENT, Boston: Transfusion is so often combined with splenectomy in the treatment of pernicious anemia that they may be considered together in discussing the effects of splenectomy. At the Massachusetts General Hospital we always test donor and recipient before transfusion in pernicious anemia and use as donor a person of the same blood group as the recipient. We transfuse on an average of 600 c.c. of blood in these cases and believe that a relapse which does not show a tendency to spontaneous remission is an indication for transfusion. Some of our patients were transfused before splenectomy and others received transfusions afterward in the relapses which eventually occur in these cases. Dr. Minot has called attention to the increased activity of the bone marrow which follows splenectomy and is shown by the appearance of Howell-Jolly bodies, a rise in the leukocyte count and an increase in the blood platelets and reticulated reds. A similar change may be observed after transfusion and appears on the fourth to tenth day. This furnishes the most favorable time to do a splenectomy in these cases which have been transfused in preparation for the operation. The mortality of splenectomy in pernicious anemia should be very low, provided the right stage of the disease is taken to do the operation. I feel that it is a mistake to remove the spleen in a relapse. Such a case should be transfused and not operated on until it has reached the stage of improvement. There is a type of pernicious anemia, one whose course is steadily downward without remissions which does not improve with transfusion and, in our experience, this type of case shows very little change after splenectomy. As to results, the figures in our series of 15 cases

agree with those given by Dr. Krumbhaar. The immediate effects of splenectomy are often strikingly favorable, but the longer the cases are followed the less encouraging they become.

Splenectomy is capable of bringing about a satisfactory remission of considerable duration. It may last six months and rarely lasts a year. After this period the disease resumes its normal course. Removal of the spleen does not prevent the recurrence of relapses or alter their severity. I doubt whether it prolongs the patient's life unless the case is followed to the end and transfused in the relapses. Transfusion is undoubtedly the best treatment for a relapse. It does not give such a permanent result as splenectomy but makes the patient more comfortable and probably prolongs his life. Therefore splenectomy and transfusion are palliative, not curative. Splenectomy diminishes blood destruction and both splenectomy and transfusion are followed by bone marrow activity which brings about a temporary symptomatic improvement. This benefit is temporary and not always certain but nevertheless transfusion and splenectomy are the most effective means we have at the present time for the treatment of pernicious anemia.

DR. HERBERT ZIEGLER GIFFIN, Rochester, Minn.: This symposium is very important at this time because it crystallizes our ideas in regard to the present status of splenectomy for pernicious anemia. I can only add our own experience to that which has been given. It is almost exactly in line with the results that have been reported. Thirty-nine cases have been operated on with an operative mortality of 3 (7.7 per cent.). There is apparently no reason why the operative mortality for pernicious anemia should be high. There have been four postoperative deaths, leaving thirty-two living patients. Five patients are at present in relapses, so of thirty-nine cases there are twenty-seven patients in good or fairly good condition. One patient lived as long as three years. The longest period during which patients have maintained a good condition is one year, which occurred in two instances. Preoperative transfusions have been given preparatory to operation to improve the general condition of the patient, to initiate if possible an upward wave and to improve the characteristics of the blood count. One can predict that four patients out of five will show a very marked gain after splenectomy and it would seem that they should be given the opportunity to have this gain without very strenuous postoperative treatment. We have given postoperative transfusions only in relapses. I wish to speak here especially of the examination of the duodenal contents of pernicious anemia patients for the blood derived pigments. We have followed up the work of Schneider reported in January in the *Archives of Internal Medicine* in thirty-three cases of pernicious anemia and have obtained high values for urobilin and urobilinogen in the duodenal contents by the Wilbur and Addis spectroscopic test in all but three. In 12 cases examined a short time after splenectomy ten gave very low value. We have examined the duodenal contents for blood derived pigments in nineteen cases of a miscellaneous group with secondary anemia and have obtained low values. In four cases of hemolytic jaundice three have shown high values. This test may prove to be important in the study of patients with pernicious anemia. For instance, if a patient shows high hemolytic values in the duodenal contents and is able, in spite of active hemolysis, to maintain a good blood picture, he should be a favorable case for splenectomy: for splenectomy is followed by a reduction of the hemolytic values. With splenic anemia our experience is of thirty-three cases. The results are uniformly good. With hemolytic jaundice our experience is of ten cases with one death. In hemolytic jaundice there has been a very great improvement in the general condition of the patient, the jaundice and the anemia. We have one patient in excellent condition who was operated on eight years ago. One case of acquired hemolytic jaundice presented a pernicious anemia blood count. Cases of hemolytic jaundice in adults which show a pernicious anemia type of blood count are particularly interesting because of a possible close relationship between the two diseases.

DR. W. S. THAYER, Baltimore: My first experience in which I had a splenectomy done in pernicious anemia dates from three years ago next November. That patient had already had distinct signs of spastic paraplegia. She made what appeared to be a complete recovery from the standpoint of her anemia and remained well for a year and a half. Her cord changes failed to progress. Then, in about two or three months, she rapidly went down hill with a relapse and died from a characteristic pernicious anemia. I felt that while we had only succeeded in producing a remission of the anemia that we had for the first time in my experience done something which arrested the progress of the cord changes and yet Dr. Krumbhaar is able to tell us that, as a rule, the cord changes have progressed without respect to the operation. Dr. Miller had an instance almost opposite to mine, that is, the anemia improved, but the cord changes grew rapidly worse. With splenectomy there is a temporary improvement in the majority of instances. The best figures show a considerable mortality from the operation. One is tempted to regard pernicious anemia as inevitably fatal and one is justified in seeking any remedy which may bring improvement. There are cases of long remissions—McPhedran's of sixteen years; others of shorter time. I myself saw one of five years and the patient died of another malady. We never need be utterly hopeless with regard to pernicious anemia and one must consider very carefully before advising splenectomy. We do in most cases accomplish a little something which we may not be able to accomplish under other circumstances, but it ought to be put very directly to the patient and it seems to me we should go very slowly in advising so serious a procedure. In regard to splenic anemia, particularly those with violent gastric hemorrhages, the results did not seem to be uniformly beneficial. My experience has been quite in accord with that of the other gentlemen who have spoken. In hemorrhagic jaundice the results appear to be almost uniformly beneficial, but there again one ought to consider very seriously the question of operation before advising definitely to have it done. If we are dealing with a case of congenital hemolytic jaundice, as a rule, the symptoms are not grave. I have three cases now under observation, in all of which the patient does not suffer much. There is a large spleen and a continued jaundice of greater or less degree quite endurable, so endurable that in none have I felt like advising splenectomy. One of these patients who underwent appendicitis associated with the removal of stone from the gallbladder withstood the operation as well as a healthy person and, indeed, three weeks after the operation the fragility of the blood was less than it was before. One should not urge an operation. The jaundice may be so serious and the anemia grave enough to justify it. In instances of acquired hemolytic jaundice it may be that the anemia is serious enough to make the operation almost imperative. These methods of transfusion have rendered the possibility of doing splenectomy in grave anemia a relatively simple matter where previously it would have been absolutely impossible. I remember an instance of splenic anemia, operated on by Dr. Finney, in a small boy, where he had waited six months that he might develop a good color. Finally, the boy's condition became so serious that he was transfused and taken to the operating room practically moribund and transfusion was done while operation was being carried out. By the end of the operation the arteries were spurting and the boy made a perfect recovery following the operation.

DR. G. A. FRIEDMAN, New York: I shall limit my remarks to hemolytic jaundice. It is the third case of Dr. Peck to which I refer. The patient stated that he was sick for eight months and on close questioning, no other illness could be elicited, except that when he was very young he had a fever which lasted for several days. There was undoubtedly no hereditary tendency in this case. When first seen, I would say that he was more icteric than sick, and, practically, he came to the clinic, not so much for his symptoms, as for his jaundice. One of my co-workers on first examination suggested catarrhal jaundice. It is very important, and especially so in cases of young people, that the first thought that should come to the mind should be catarrhal jaundice. But

an icterus which begins acutely with enlargement of the spleen should suggest hemolytic jaundice. We know well, however, that in a proportion of cases of catarrhal jaundice the spleen is enlarged and not the liver. But on considering more carefully the history in the case at hand, one must see that we are dealing with an entirely different condition. There was an absence of pruritus during the entire period of the illness — eight months. The absence of bile in the urine, and the presence of urobilin and urobilinogen, the presence of bilirubin in the blood, and the presence of bile in the stools, are aids in the diagnosis. The anemia here, however, was not marked. The resistance of the red blood cells to hypertonic salt solutions was only slightly diminished. It was between 0.35 to 0.45, but the percentage of the reticulated red cells was increased. The result of the operation was marked. Patient was practically free from jaundice on the fourth day after the splenectomy and on the eighth day there was no trace of it. I saw him at the end of last March. There was no jaundice and the patient was well. The medical treatment is absolutely without any benefit.

DR. SAMUEL J. MELTZER, New York: I wish to point to a possible factor which, as far as I know, has not been referred to either in the experimental or in the clinical work on the subject. We know that the red corpuscles run in the middle of the blood stream and are, therefore, as a rule, not exposed to any kind of shocks. Some forty years ago I saw a fragile red corpuscle riding on the ridge formed by two dividing arteries. The blood cell was finally broken into two fragments. It then occurred to me that the blood corpuscles while passing through the spleen must be subject to innumerable shocks. The blood, after leaving the renal artery, passes through a considerable amount of alveolar tissue, before it enters into the renal veins. The blood cells in their rapid run through these tissues must continually come in conflict with some jarring ridges. This gave me the notion that fragile red blood corpuscles may readily break down in the spleen or may be prepared to give up some of the hemoglobin, and that some of the nucleated cells may lose their nucleus there. I was also thinking that the mechanical shocks which the white corpuscles receive while passing through the irregular arrangement of the alveolar tissue may be affected; it may possibly hasten their natural division. These considerations were the starting point for many of the investigations on the effect of shaking on red cells, bacteria, ferments and toxins. The first investigation of this kind was carried out in 1884, together with Dr. Welch. In the course of the last year Dr. F. L. Gates studied in our laboratory at the Rockefeller Institute the effect of shaking on red cells of splenectomized dogs. I am not ready to report here his results. I merely wish to call the attention of those who are interested in this subject that the mechanical effect of the alveolar construction of the spleen may have a certain influence on the red blood corpuscles, at least in pathologic conditions of the blood, and may be, therefore, a potent factor in certain forms of anemias.

DR. ROGER I. LEE, Cambridge, Mass.: The ordinary course of pernicious anemia is very bizarre, although it is next to impossible to tell from a few cases whether the effect of a particular therapeutic agent is favorable or not. The blood picture in pernicious anemia may be said to correspond roughly to blood destruction and blood formation. The same thing holds true of hemolytic jaundice and splenic anemia. We have studied splenectomy and transfusion from the point of view of the effect of stimulating the bone marrow activity by the method that Dr. Minot outlined. We have used no particular method, but we have used those general comprehensive estimates of all these methods. We do not think, for example, that the reticulate cells alone are of very great value, but the qualitative changes in the reticulate cells, especially with the blood platelets and white corpuscles, give us good information in regard to the bone marrow. After splenectomy and after transfusion we always get a slight tendency toward stimulation of the bone marrow. That stimulation of the bone marrow varies a great deal. It is much more constant. It is much more constant and energetic after splenectomy than after any other therapeutic procedure. The benefit of transfusion is to furnish bulk of blood which may then be destroyed very rapidly, but the main benefit of transfusion is to inaugurate a remission which means merely to stimulate the bone marrow and it is only by following the patients that we can tell whether they are benefited or not. We merely say that after splenectomy rather constantly and after transfusion occasionally one does see the signs of a stimulated bone marrow.

DR. E. B. KRUMBHAAR, Philadelphia: It has been generally accepted not only that blood transfusions are a valuable prelude to splenectomy, but that in themselves they constitute an efficient method of combating pernicious anemia. In fact it remains to be proved whether or not equally good results would not be obtained by repeated transfusions in the absence of splenectomy, although the impression is prevalent that the improvement following splenectomy is more lasting. This is to be expected if it is borne in mind that whereas transfusion merely improves the condition of the blood, splenectomy removes the most apparent noxa. In connection with Dr. Thayer's remarks about the long periods of spontaneous remissions, I would call attention to Cabot's series of 1,200 cases in which only three patients were considered as "cured," in other words, did not develop symptoms during five years. May it not be that among the small number of splenectomized patients that we have thus far had opportunity to see, there is a group which will eventually give us a larger proportion of long surviving cases? I hesitate to use the word "cure," because we do not think of any of them as really cured. In regard to the use of the term "splenic anemia," I think most physicians would agree with Dr. Miller that it probably includes one or more clinical conditions of uncertain or varying etiology. But just as the hemolytic jaundices, and probably also von Taksch's disease have been separated from this group with profit, so also Gaucher's splenomegaly, with its unique pathology and well-defined symptom complex, should to my mind be considered an independent condition. Thus "splenic anemia" in the present state of our knowledge might profitably and feasibly either be discarded entirely, or considered as synonymous with Banti's disease, or with the two early stages of that disease.

DR. JOSEPH L. MILLER, Chicago: Not every patient with hemolytic icterus is inconvenienced by it. In fact, the majority of these patients suffer little or no inconvenience aside from discoloration of the skin. For this reason, Türck has referred to it as a cosmetic disturbance rather than a disease. It would seem, therefore, a question whether an operation with a mortality of at least 10 per cent should be undertaken in these cases of hemolytic icterus, unless the person shows a definite disturbance or unless he should be willing to undertake the risk associated with the operation in order to be relieved of the icterus. There has recently been a report of three cases of hemolytic icterus cured, the result of Roentgen-ray treatment. In those cases in which splenectomy is not undertaken it might be well to try the effect of the Roentgen ray to see whether a cure might be effected.

Reduction of Mortality in Indian Armies.—The report of the sanitary commissioner, with the government of India, gives a table showing the remarkable improvement in the health of the native army since 1880. We will here summarize the table:

Year	Death Rate (Including Deaths of Absentees on Enrolled Strength)
1880	41.12 per mille
1885	16.09 per mille
1890	18.60 per mille
1895	15.71 per mille
1900	18.57 per mille
1905	9.50 per mille
1910	7.12 per mille
1911	6.78 per mille
1912	5.66 per mille
1913	4.55 per mille
1916	3.73 per mille

During the same period the death rate for British troops dropped from 24.8 to 4.3.—*Indian Medical Gazette*, July, 1916.

THE STATUS OF PHYSICAL THERAPEUTICS IN THE MEDICAL COLLEGE CURRICULUM OF TODAY*

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BATTLE CREEK, MICH.

The brevity of the time assigned and devoted to the study of nonmedical therapeutic agents in the present medical college curriculum was very forcibly brought to my notice when I was asked by the faculty of a Class A school to present in sixteen hours this entire field with the exception of electrotherapeutics. The results of the attempt were far from satisfactory to the students and to myself. It was possible in this space of time only to make brief mention of the physiologic effects and therapeutic uses of such measures; and there was no time for demonstrations and no opportunity for the students to become familiar with the technic which is so essential to the proper application of these therapeutic agents.

It occurred to me that it would be interesting to know what attention is given to these subjects in the medical schools of the United States, and the material gathered in the course of my subsequent investigation forms the basis of this paper. This information is presented with the earnest desire to encourage a more systematic teaching of these subjects, so that every graduate in medicine on entering practice may be prepared to make scientific and effective use of physiologic therapeutics. My information was obtained by sending to each of the medical colleges listed and classified by this Association an inquiry as to the number of hours devoted to the presentation of the subjects of hydrotherapeutics, electrotherapeutics, mechanotherapeutics, massage, medical gymnastics and dietetics. Replies were received from fifty-seven schools, forty-two of which are listed in Class A, nine in Class B, and five in Class C. The replies to my inquiry indicate a decided interest in the subject, and many express regret that time and suitably equipped laboratories are not available for proper presentation of the subjects.

In 1908 the American Medical Association, through its Council on Medical Education, prepared an outline for a model medical curriculum. Their report, which was issued in September, 1909, represented the work of a committee of 100 of the leading medical educators of the United States and Canada. In their schedule of hours devoted to the different subjects of the medical curriculum, an allowance of sixteen hours in the third year was made for nonpharmacal therapeutics, and in the fourth year fifteen hours were devoted to electrodiagnosis and therapeutics. There was no other definite time allotted to this class of therapeutic agents. Under the head of nonpharmacal therapeutics were classed hydrotherapy, climatology, dietetics, electrotherapeutics, psychotherapy and other physical and physiologic measures. The members of the committee considered this sufficient time for the theoretical discussion and demonstration of the above named subjects. Some members of the committee felt that more time should be devoted to this class of therapeutics, but the limited total number of hours at their disposal determined their final recommendation.

The same committee advised that 165 hours be devoted to pharmacology and toxicology. It is not my intention to criticize the committee's report, but I am certain that the time allotted to nonpharmacal therapeutics is entirely insufficient to give the student a degree of proficiency in his use of these methods equal to that which he is supposed to acquire in the use of medicinal agents. I have referred to this model curriculum at this time in order that comparison may be made between the standard schedule thus established and the average schedule of the investigated subjects in operation in the medical schools.

In summarizing the collected information, I found that the average time devoted to the nonpharmacal subjects exclusive of psychotherapy was sixty-two hours, or about four times that recommended in the model curriculum. In all but two or three of these schools special work was being given in one or more of the subjects of this group. In seventeen of the schools a special course was devoted to hydrotherapy; eleven other schools gave a course in which hydrotherapy was combined with one other subject of the nonpharmacal group. Dietetics was considered in a special course by twenty-two schools, the average number of hours devoted to this subject being thirty. The majority of schools are giving special courses in electrotherapeutics, a few considering the subject only in connection with other courses, such as neurology. That electrotherapy has a definite place in therapeutics cannot be questioned; and it is unfortunate that because of a lack of satisfactory information it is still so much in the hands of the "irregular practitioner" that many physicians hesitate to use it, fearing criticism from the profession. In twenty-three schools giving a special course in this subject, an average of twenty-three hours is devoted to the subject.

Very few of the schools were able to demonstrate the proper technic of the physical measures because of a lack of suitable equipment. A few schools, through their hospital connections, were able to demonstrate such procedure before their students, but very few of them required such work on the part of the student individually as would be required in a practical course in pharmacology. A few schools still give the greater part of this work incidentally in connection with the courses in general therapeutics or in clinical medicine.

The objection to these subjects being presented in this way is that the student has not familiarized himself with the proper application of such measures, nor is he so drilled in their physiologic action as to allow him to make use of these measures with the same precision with which he would employ medicinal agents. Until it is possible to teach them as laboratory subjects where the different forms of apparatus necessary to the application of such treatment is available, it will be of no practical use to the practitioner unless he takes some special work to obtain that proficiency which will enable him to determine the proper application of such remedial measures to the condition before him. Where a personal opinion has been expressed by those in charge of the department of therapeutics, the opinion is quite universal that a sufficient amount of time is not at their disposal, nor have they the equipment for properly teaching the use of nonpharmacal measures. It is to be hoped that the time is not far distant when medical schools will have more satisfactory means of imparting information concerning these subjects, and in my opinion this edu-

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

cation of the profession will very largely solve the problem of the irregular practitioner who attempts to commercialize an imperfect knowledge of these subjects to the great disadvantage of the patient.

As to the lack of time and proper facilities, the dean of one of the leading schools of the country expressed himself as follows:

> We do not pretend that, as far as mechanical treatment is concerned, we are as efficient as we should like to be. The executive committee of the hospital has been attempting for some years to obtain endowment for a department of physical therapy, but so far we have been unsuccessful. We have the matter in mind, however, and meanwhile we are continually using many of the methods of physical therapy with the somewhat incomplete apparatus which is available to us.

Another answered as follows:

> In reply to your recent letter would say that the status of physical therapeutics in this medical school is not at all satisfactory. Indeed, from my experience I would say that this form of therapeutics is very unsatisfactory in most all medical colleges and hospitals. In such work it is very difficult to differentiate between the honest, conscientious seeker for the truth, the therapeutic enthusiast who does not use critical methods of control for his work, and the unprincipled money-maker who uses such methods as a form of exploitation. Although I heartily approve of all forms of physical therapeutics, it seems wise to me, in the development of them, to proceed slowly. The only way to differentiate between the classes of workers above mentioned is, to my mind, the keeping of very careful records which may be critically analyzed as data by competent medical men, to have an adequate series of control cases, and to follow up the end-results of this form of work. It has been the tendency in most medical schools to discontinue special departments of therapeutics, the function of which has been taken over to a considerable degree by those responsible for the teaching of pharmacology and clinical medicine and the special branches.

The question has been raised by some as to the advisability of presenting the nonpharmacal subjects as individual courses, suggesting that they should be given consideration under the general head of therapeutics. I quite agree that this could be done, but unless the same careful attention is given the physiologic action and proper technic of the use of these measures, as is given to the use of medicinal preparations, the instruction will have been insufficient. The student must be given opportunity to obtain sufficient proficiency and information to know when such measures may be used with profit and to give definite directions as to how they should be used. It is as essential that this be done as that specific directions be given in regard to the proper dosage and frequency of administration of a drug. Would the physician be pardoned if he should direct the nurse on a case to administer the alkaloids or other potent drugs in any way she might think best? But this is just what is being done by many of the physicians who are attempting to make use of nonmedicinal agents. Undoubtedly, many patients are not only not benefited but are in many cases injured by such therapy.

The empiric use of hydrotherapeutic measures is fraught with grave danger in many organic diseases, and the same may be said with reference to the use of massage or other physical measures; but this should not condemn them as of no value. It is not desired to argue as to the beneficial effects of the nonmedicinal agents in disease. The fact that they have stood the test of time and are being used more and more in a scientific way is sufficient proof of their value. That they have been used empirically and are today exploited by some in such a way as should be severely condemned is no more to their discredit than are the facts with reference to the "patent medicine" question. The opinion held by the profession with reference to the physiologic action and therapeutic value of the majority of the pharmacopeial drugs has been completely changed as a result of information obtained by painstaking effort on the part of laboratory workers. When equal attention is directed to the other therapeutic measures, it will be found that in many situations they can be used to much greater advantage than the medicinal agents. Unless our profession is to be criticized as are those who refuse to acknowledge virtue in any line of treatment except that to which they are wedded, it will be necessary for us to give proper consideration to all valuable therapeutic measures, and in so doing we shall immeasurably increase our usefulness and have the confidence of the public to a much greater degree.

The one best qualified to prescribe the diet in diseased conditions should be the physician; but when he is ignorant of the simplest principles of dietetics and advises his patient "to eat whatever he likes, as much as he likes and whenever he likes," it is only to be expected that the patients will appeal to those who profess, under whatever name, to have sufficient knowledge of the subject to prescribe intelligently in specific conditions. Until within the past few years the subject of dietetics has not received attention in the medical curriculum as a specific subject; but, fortunately, conditions have now changed, and such a course is given in practically every school of the United States, and more time is devoted to it than was suggested by the committee on a model medical curriculum for the whole subject of nonpharmacal therapeutics, which comprised the subject of dietetics along with others. The work being done by Allen with reference to diabetes, the late researches as to the etiology of pellagra, and the study of anaphylactic phenomena after the ingestion of certain foods, and toxic conditions due to intestinal disturbances, with other considerations equally important, show the need of thorough instruction in this subject. It is not sufficient that the student hear the subject mentioned in a general way. He needs specific information. But we are told that the difficulty in accomplishing this is the lack of time. The curriculum is already overcrowded with apparently indispensable subjects. A possible solution of the matter might be found by those schools which require one or more years of college work for entrance by requiring that the premedical work shall have a specific relation to the regular medical course, and shall lessen the number of courses now crowded into the medical curriculum.

The modern hospital is very careful to install the best available equipment for the application of physical therapeutics, but unfortunately little use is made of it. This can in many cases be explained by the imperfect knowledge of the subject possessed by the medical staff. It is hardly to be expected that satisfactory use could be made of a therapeutic agent which the physician had never seen demonstrated and the physiologic action of which he had never observed. A complete pharmacy without a working knowledge of the drugs therein contained would be a comparable situation. Great effort is being made to determine exactly the physiologic actions of the drugs that are listed in the

pharmacopeia and that are being introduced in large number by chemical manufacturers; and certainly all due credit should be given the laudable efforts in this line. But of the hundreds of drugs that are at our service, how many are indispensable? The following quotation from a recent editorial[1] in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION relative to this subject is of interest in this connection:

> Until very recently, we were compelled to acknowledge that little if any progress was being made in internal medicine so far as drug therapy was concerned. Everybody knows of the progress made in other branches—in bacteriology, in pathology, in biologic chemistry, in surgery, in etiology and in the application of technical methods to diagnosis. Recently, however, pharmacologic research and the application of scientific methods in the study of the physiologic action of drugs are resulting in definite, positive progress. An important lesson, incidentally learned through this scientific investigation, is the fallibility of the drug therapy described in textbooks. . . . Many drugs have been, and still are, vaunted in textbooks as valuable in a variety of conditions, whereas scientific investigation and controlled clinical observation have proved them to be totally worthless; others are proving to be of value in an extremely limited number of conditions. The sooner writers of textbooks realize this fact and enter into the spirit of the new era, the better for the public and for scientific medicine.

When an individual has learned by experience of the fallibility of drugs, he has not infrequently lost confidence in his physician and has been led to employ as his adviser some one professing to cure physical ills without resorting to drugs. The number of such individuals has become so large as to provide a considerable field for the drugless healers, and the influence of this class has been so great with our state legislatures that they have felt compelled to grant some form of recognition to these irregular practitioners. Because the medical profession in the past has ignored to so great an extent all other therapeutic measures than drugs, may it not be possible that the responsibility for the prosperity of osteopathy and similar therapies rests largely on their shoulders?

There is no doubt as to the value of suggestion in a *large number of pathologic conditions;* but because the regular physician has been imperfectly educated in psychology and has used it so little in his work, he has permitted large numbers to turn to Christian Science or New Thought for the relief of all their ills. And so neglect on the part of the profession to make proper use of physical therapeutic measures has made it possible for the irregular practitioner to recommend himself to the public through that measure of success which apparently attends his efforts in the application of these lines of treatment. That this condition of affairs is unfortunate is very apparent. The irregular practitioner, because of his imperfect education, is unable to make a careful and proper diagnosis, and this results in his attempting to use his particular method of treatment in cases where it is decidedly contraindicated and may cause needless sacrifice of human life. Instances of this are common knowledge.

The treatment of the chronic invalid in the future will be more and more institutional, and if successful, must depend on a system which will include the nonmedicinal form of therapeutics to a large degree. The question of proper diet can no longer be left wholly in the hands of the hospital authorities. The physician will be expected to prescribe this in a specific way in each case. The proper application of massage cannot safely be turned over to some one bearing the brand, "trained in Sweden," but should be directed and supervised by the physician. The value of passive exercises in the treatment of certain conditions is inestimable. Tonic effects may be more satisfactorily obtained by hydriatic treatments than by the prolonged use of any so-called tonic agent of the pharmacopeia; and in hospital practice where proper facilities are provided, the value of hydrotherapy in a wide range of cases should be more generally appreciated. Similar remarks might be made about other nonmedicinal therapeutic measures. The day is past when, in medical cases, the patients will submit without protest to being confined in hospitals and treated solely by drugs. Patients are coming more and more to avail themselves of massage, exercise, hydrotherapy, and to insist on having the advantage of such measures in conjunction with medicinal therapeutics and a prescribed diet.

One reply, received from the dean of one of the university medical schools, was as follows:

> I would state that the course in therapeutics devotes itself rather more than half the time to subjects not related to the use of drugs, and the emphasis throughout is laid on attending first of all to conditions of living, nursing, dieting, securing of favorable mental attitude on the part of patients, prophylaxis, etc. . . . From time to time students make reports on such subjects as x-ray therapy. Amphitheater demonstrations of certain simple hydrotherapeutic treatments, such as the typhoid bath are given, but, owing to lack of facilities, most of the work in physical therapeutics is confined to discussions.

And so it is with the majority of schools. While recognizing the value of such measures, they find it impossible to present them properly, owing to lack of time and proper facilities. This, then, seems to be one crying need in our schools. While the time devoted to these subjects is far greater than suggested in the model curriculum, it is yet far from sufficient to present these subjects in such a thorough manner as to fit the student to use them in a practical way. The more serious lack of properly equipped laboratories makes it impossible to present them in a scientific way, with the result that these measures are often prescribed in an empiric way, and, under the circumstances, recommend themselves neither to the physician nor to his patient.

The day is past when the public is willing to be treated by medication solely. Today, intelligent patients expect that their physician will be able, in addition to making a correct diagnosis, to prescribe that form of treatment that will most readily restore them to health. They expect him to tell them the cause of the trouble and how they can avoid it in the future; how and what and how much they should eat, how they should bathe, and what exercises would be to their advantage. A knowledge of drugs only will not permit the physician to do this. Is it necessary that the patient be compelled to consult, in addition to his physician, a food expert and a gymnasium director to find out what to eat and how to exercise, or to consult an osteopath or a professional masseur to obtain the benefit from manual movements? It is high time that the physician be able to direct in all the activities having to do with the well-being of his patient, and that he so minister to all his physical needs that never again will the patient think of him as a dispenser of drugs only.

1. The Fallibility of Drug Therapy in Textbooks, editorial, THE JOURNAL A. M. A., May 27, 1916, p. 1708.

ABSTRACT OF DISCUSSION

Dr. Thomas F. Reilly, New York: Physical therapeutics is the one branch of medicine wherein those who become interested are exceedingly prone to run to extreme statements as to its therapeutic possibilities. No one denies that physical therapy has a place in the alleviation of symptoms and indirectly in the cure of disease; but it is by no means the panacea that its apostles would have us believe. Unless the curriculums of our medical schools are freed from some of the work necessary to successfully pass state board examinations, it is not possible to give more than a fraction of the time advocated in this paper to a study of these measures. Like the reader of the paper, each specialist cries out that the medical school does not go thoroughly enough into his particular specialty. After all, the medical school can furnish little more than the principles of medicine in the time allotted to study—the alphabet of the science, as it were. The words and sentences must be filled out in hospital practice. The application of the use of the physical measures as recommended are time consuming, and from an economic standpoint are not practical in everyday practice by the general practitioner himself, but must be done by nonprofessionals, just as the pharmacist must take up most of our preparations. Of course, the basic principles of such therapy must be taught. This applies with special emphasis to Roentgen-ray diagnosis and therapy, a specialty which must soon find a relatively large place in every curriculum.

Dr. N. P. Barnes, Washington, D. C.: This condition might be ameliorated after the student has spent so much time in the laboratory by a little work in a gymnasium which should be connected with each college. I recommend to my students, especially those in the second year, finishing their anatomy, to go to a gymnasium to work out and study their muscles. Nearly every city supports one or more gymnasiums, which are always accessible to the properly minded medical student. I had a young man in my office who was very well developed on the right side, but not on the left, because he was a tennis player. I prescribed that he put his right arm in a sling and play with the left arm, and in the course of time he got some development on that side. We all prescribe massage and how many of us know anything about it? The student in the future should be able to direct this massage, and I feel that when I tell patients that they need massage that I like to supervise it because we get different results from different manipulations.

Dr. Walter E. Simmonds, Chicago: For the last two years I have been engaged in teaching this work. I have only sixteen hours for all the practical instruction in hydrotherapy, electrotherapy, phototherapy and mechanotherapy. A lecture course is given by the head of the department. He has worked for years to secure some kind of equipment for a laboratory in which to give this instruction, but was unable to secure an adequate appropriation for this purpose; all that could be obtained was $75, and, of course, we could not procure a very complete equipment with this amount. I maintain that the same time should be given to laboratory instruction in physical therapeutics as is given to pharmacology. Our students have a two-hour period in pharmacology to one in nonpharmacal therapeutics. Dr. Reilly mentioned the difficulty of obtaining men trained in this branch. I see no reason for this. If you want a man in your hospital for Roentgen-ray work you send him to get this special training. Why should you not send a promising young physician for training in physical therapeutics? The superintendent of a large Chicago hospital told me that the reason their department for physical therapy was not more used was that the physicians who attended the hospital did not prescribe this form of therapeusis. Having obtained a man trained in this branch, and such men can be obtained if the salary is paid, an adequate department should be furnished him; do not handicap by less equipment than a second-rate bathhouse would have. Give him an equipment that would enable him to do the same kind of scientific work as is done in other branches of medicine. Men working along one particular line become enthusiasts, but with the close cooperation of those engaged in clinical work, as well as those teaching the fundamental sciences, you will find that he will do as good scientific work as in any other department. I protest against placing the nonpharmacal equipment in the basement or other least desirable part of the college or hospital.

Dr. B. Fantus, Chicago: This paper brings out the important fact that we are properly teaching only one half of the therapeutics we should teach in our medical schools. When the practice of a hospital or of a successful physician is examined, it will be found that medicinal therapeutics constitutes only one half or less of treatment, and that the other half is made up of physical, psychic and dietetic measures; and this in spite of the fact that most of us never had adequate instruction in the measures. I believe the time has come and is here now, when it must be recognized that the doctor who knows nothing but drugs is as reprehensible as he who solely practices massage, electrotherapy, hydrotherapy, etc. I take issue with the idea brought out in the discussion that some of these measures are properly measures for specialists. They will never come to their own until every physician is competent to practice them. Take massage, for instance. Every doctor frequently meets cases that need massage; and, if he does not know how to apply it and in certain cases to teach the manipulations to the patient, the latter will generally not obtain the benefit of these manipulations at the time when they might do the most good. There are million of joints in the United States that have become crippled because of the lack of massage at the time when it was needed. Medical gymnastics should be taught in the medical schools by giving the student the physical exercise he needs in the form of instruction in specialized gymnastics, such as programs for patients with heart disease, constipation, scoliosis, etc. Electrotherapy, as well as hydrotherapy, should be in the hands of every medical practitioner to accomplish the most good for the people. Our ignorance of dietetics is the laughing stock of the world. It is high time to remove this stigma from the medical profession.

In all probability nothing will be done. Years will pass before a change will come, because the leaders of the medical profession are not conversant with these measures of treatment. If they know little or nothing about these measures, how can they be expected to provide adequately for them? The very provision they have made for them in the standard curriculum—sixteen hours—shows how little they know about these various measures. It is not desirable to wait for a fifth year to be added to the curriculum before these subjects be taught adequately. If necessary, the time given to anatomy might be cut down somewhat to give the students a better training in these subjects.

Dr. E. L. Eggleston, Battle Creek, Mich.: I trust you will not consider that I am bringing this subject before you in a critical way. It may be that the leaders in medical education have done the best they knew how to remedy the situation; nevertheless, I feel that it is high time there was a change. I am in institutional work, and too many of the patients coming to me have for their medical advisers irregular practitioners. One of the reasons for this is the slight attention given to physical therapeutics, and I trust the day will soon come when there will be more attention given to this particular work. I appreciate the criticism which has been directed toward those using these measures empirically. Their value depends on their being used with the same degree of precision found necessary for the advantageous employment of the medicinal therapeutic agents.

Transmission of Disease by Insects.—Centuries ago, there was suggested the possibility that insects were concerned with the spread of disease, and from time to time there have appeared keen suggestions and logical hypotheses along this line that lead us to marvel that the establishment of the truths should have been so long delayed. One of the earliest of these references is by the Italian physician, Mercurialis, who lived from 1530 to 1607, during a period when Europe was being ravaged by the dread "black death," or plague. Concerning its transmission he wrote: "There can be no doubt that flies feed on the internal secretions of the diseased and dying, then, flying away, they deposit their excretions on the food in neighboring dwellings, and persons who eat of it are thus infected."—Riley and Johannsen, Handbook of Medical Entomology.

REPORT OF TWO CASES OF SCOLIOSIS

ACCOMPANIED BY PRESSURE PARALYSIS OF THE LOWER LIMBS *

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The purpose of this paper is simply to report two cases presenting a condition which, in so far as I know, is unique, namely, a motor spastic paralysis of the lower limbs associated with and apparently depending on scoliosis.

The paralysis in both cases appeared to be in every respect the same as the paralysis we not infrequently see in cases of tuberculous spondylitis, and which we believe to be due to pressure on the anterior surface of the cord from the inflammatory process involving the vertebral bodies.

One of these patients was examined by two eminent neurologists. Their reports will presently appear in this paper. Both of these patients were treated on the convex gas-pipe frame. One was carefully nursed and the paralysis passed off by the end of four months; the other, less well nursed, had gained voluntary control of the movements of the limbs at the end of six months, but the tendon reflexes continued exaggerated.

CASE 1.—Girl, aged 11, was seen by me in June, 1913. She was large and well developed. The spinal curvature had been noticed for some time. There were marked round shoulders, a well marked lumbar curvature to the right with considerable rotation for the degree of lateral deviation, and a slight dorsal curvature to the left which on forward bending showed a marked rotation deformity. Roentgenograms showed a somewhat irregular fifth lumbar vertebra, with a slight lateral curve to the right starting from the deformed vertebra. In the dorsal region there was a short, sharp curve to the left with extreme wedging of the bones, one of which, the ninth, has an extra rib attached to the thicker side.

The patient was treated by daily exercises, and for nearly a year wore a leather corset made over a corrected plaster torso. The girl as a whole looked much straighter at the end of that time. On account of the extreme heat of the summer the corset was left off; but the exercises were continued. At the end of another eight months, the corset not having been resumed, the girl had grown rapidly and had become very stout. She looked straighter, but the roentgenogram showed that the curvature had really increased.

In July, 1915, two years after the first observation, it was reported that she had been walking "queerly" for about two weeks, and had fallen at least twice. For a month or more she had been "uncertain" in her bowel movements, but had had no bladder symptoms.

On examination, her walk showed spasticity, more noticeable in the right than in the left leg; the patellar and Achilles reflexes were exaggerated, and ankle clonus and the Babinski sign were present.

The Roentgen-ray plates read by Dr. Hollis Potter showed "no material change (from former plates) in the anterior posterior view. Transverse view . . . showed wedging in front, but less than to the right side."

Dr. Archibald Church examined the patient and kindly provides the following report:

"About six months ago her mother noticed that she was getting a little clumsy on her feet. About two months ago she commenced to have difficulty in the action of the bowels with a slight sphincter relaxation. She would often feel an inclination to go to stool but experienced inability in defecation, and then perhaps in a few minutes or hours involuntary defecation would take place.

"She complained of no disturbance of sensation, though stating to her mother that her legs, especially the right leg, felt heavy and stiff. More recently she had encountered difficulty in mounting stairs and had fallen once or twice, and walks in an uncertain, rigid manner.

"Upon examination the patient presents a very well developed appearance for a girl of her age. Menstruation has been established and is regular. Her general appearance is one of robust health.

"The face is not symmetrical. The left eye is apparently larger than the right. The left side of the face is decidedly larger than the right, and she has a way of talking almost entirely on the right side of her mouth. But innervation is symmetrical on both sides of the face. There is no evidence of cranial nerve palsy of any kind. Upon extreme deviation of eyes to right or left, very slight nystagmoid movements may be induced. Eye grounds normal.

"The upper extremities show no variation of innervation either for motion, sensation, or the reflexes.

"The abdominal reflexes are elicited with difficulty, owing perhaps to the adipose deposit. The left umbilical reflex is very slight; the right cannot be elicited.

"The lower extremities present very greatly exaggerated knee jerks, and rectus clonus can be demonstrated on the left side. There is distinct ankle clonus also on the left side, somewhat slighter on the right side. Babinski reflex is present on both sides. The toes stand in a retracted hammer position, similar to the foot of Friedreich's ataxia.

"There are no vesical symptoms, although she is not quite sure about holding her urine as well as formerly.

"Sensation objectively tested seems to be normal in all its modes and tenses throughout the body and extremities.

"Thoracic, abdominal and pelvic organs normal. Blood and urine normal.

"Opinion: In my opinion there is pressure on the cord in the region of the sharp dorsal bend, showing itself in the spastic condition of the legs and the motor weakness and reduced voluntary control of the lower abdominal action, sphincter control, and locomotion.

"The condition is apparently congenital, but owing to the increasing weight of the body and the demands of growth, has probably induced cord symptoms during recent years."

The child was placed on a convex gas-pipe stretching frame and cared for continuously by a trained nurse. At the end of four months the reflexes appeared to me to have returned to the normal; and the spine was decidedly straighter. The treatment was continued after a consultation with Drs. J. D. Griffith, Francisco, Skoog and J. N. Jackson.

March 23, 1916, Dr. A. L. Skoog, who had seen and examined the patient very frequently, reported as follows:

"In the history I wish to call particular attention to the observation of both parents that . . . has always had an 'unusually peculiar gait.' My neurological examinations have been made every one to three weeks, the first being made on July 19, 1915.

"The mental state has always been perfectly normal. Her even, placid, uncomplaining and obedient disposition has been striking. The eyelids tightly closed show some tremor. The tongue was protruded mesially but had much incoordinate tremor. There were some nystagmoid movements when the eyeballs were turned to the extreme right or left. No other cranial nerve disturbances. Some tremor was seen in the outstretched fingers. Gait was greatly impaired, caused chiefly by disturbed coordination, left more than right. There was much spasticity at the ankles, less at the knees, and still less at the hips. The foot deformity was marked, having a moderate resemblance of the Friedreich's type, left greater than right. The various leg movements were decidedly ataxic. A mild dysdiadokokinesia was found, left slightly more than right. All deep reflexes were plus and much more so in the lower extremities. Ptepatellar reflexes were pronounced. There was a tendency to right clonus, and a more marked unsustained one on the left. These clonic tendencies disappeared after three or four taps. There was a definite right positive Babinski and a more marked one on the left. A glossy or trophic skin was present in the lower extremities. No sensory disturbances could be elicited.

* Read before the Section on Orthopedic Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

"Subsequent examinations have shown a slow but quite uniformly continuous improvement. At this time the reflexes are less pronounced. The spastic state is much improved. There is less ataxia in the lower extremities. The positive Babinski has changed to a negative one. The Friedreich's foot and nystagmoid movements continue.

"Conclusions: In my opinion the patient is suffering from some congenital or early developmental defect, involving especially some of the lower coordinating tracts. There has resulted a secondary cord compression from the dorsal vertebral deformity."

Case 2.—Girl, aged 16, was first seen by me in October, 1914. Her father is a clergyman, and both he and the mother have had "nervous collapses." There is one younger child who is normal. The patient at birth had a spina bifida in the upper dorsal region. When about 9 weeks old she had, by Dr. Jepson of Sioux City, three iodin injections ten days apart into the tumor mass. She walked at 3 years. She was never a rugged child. When about 7 years old her mother noticed that the left shoulder was higher than the right. She was bright and quick in school. When about 14 years old her health began to fail, and she left school at the end of that year. The digestion was bad; she was fed on beef tea and malted milk; she lost weight and strength, but the loss of strength was mainly in the legs. During her fifteenth year Dr. Chase made Roentgen-ray pictures at the Battle Creek Sanitarium, and reported:

"There was a destruction of the bodies of several of the dorsal vertebrae, which I estimate to be the fourth to the seventh, inclusive, the destruction being the most marked between the fifth and sixth. There was a marked curvature of the spine to the left as well as anteroposteriorly. I was unable to demonstrate a perispinal exudate, such as is often seen in true Pott's disease." A "poroplastic cast" was applied and weight and pulley traction. The general health improved after two months. She was losing all motor power in her lower limbs, and after some three months was sent home. The limbs became utterly paralyzed. After another three months there was a slight return of motion in the right foot; after a while motion appeared in the other foot. By the following March (1914) she was able to sway the feet from side to side at will and flex the knees. By July she could move her feet in bed as she wished, but the limbs had not lost their rigid tension.

I first saw this patient the following October (1914). There remained from the spina bifida a mass the size of a small and shriveled peach at about the third dorsal vertebra. There was an extreme curvature of the upper two thirds of the dorsal spine to the left with an extreme degree of rotation deformity and the rib deformity characteristic of scoliosis. She sat in a wheel-chair; she could move her limbs at will, and stand and walk a few steps with help. The patellar and Achilles reflexes were greatly exaggerated.

Returning home after a few days, a distance of about 200 miles, she again lost the use of her limbs. She was put on a convex gas-pipe frame with instructions to remain there constantly. To illustrate the care she had, I will relate what I found when making an unexpected visit in January of this year. She was a block from home at the house of a neighbor, on her back on a soft couch. The wheel-chair and stretching-frame were in front of the house. She was wearing a large padded diaper into which she passed both urine and feces, for a "convenience," her mother said; but the girl said that she knew when she did it, and that she could control both her functions. She has had a daily "internal bath" since she was at the Battle Creek Sanitarium in 1913. Examination showed ankle clonus absent on the right side, and but slightly exhibited on the left side; the patellar reflexes were still greatly exaggerated; but she could move her feet and legs at will. In a word, there had been some considerable improvement, but she was far from recovered from her spastic condition.

I will not offer any theories as to these cases. The condition is new to me.

7 West Madison Street.

ABSTRACT OF DISCUSSION

Dr. Leonard W. Ely, San Francisco: I had a case, similar to the one Dr. Ridlon described, with spastic paralysis. The patient would not submit to jacket treatment and the paralysis was slowly increasing when he was last seen.

Dr. J. D. Griffith, Kansas City, Mo.: I would say to Dr. Ridlon that the case is still under treatment. We are pursuing it right along. The patient was a very fleshy woman, and very large. She weighed 165 to 170 pounds at the time of submitting to treatment. There was a positive von Pirquet, although this does not mean anything necessarily, I suppose. It is, however, corroborative. How much the therapy had to do with the restoration of the spastic condition it is impossible to tell. She is taking potassium iodid. The waist line was reduced 8 inches during the time she was on the frame, but that may have been due simply to the use of "Kissingen" salts, three times a day, in large doses. I reduced the protein and, to a great extent, the sugar. I could not cut out all the candy. The other treatment amounted to from 10 to 25 grains of potassium iodid three times a day. She has lost the spasticity and walks naturally in a corset with steel stays in it, keeping up continuous hyperextension. At night, she takes off the corset and goes on the frame; and in the morning she puts on the corset while still lying down.

Dr. Reginald H. Sayre, New York: I should like to report a couple of cases—one referred to me by Dr. Spitzka, twenty odd years ago—that presented almost identical symptoms with this. I believed it was multiple sclerosis in a child that had lateral curvature; and on careful investigation, it was found that clumsiness in movements of the upper extremity had distinctly antedated the noticing of the lateral curvature in the spine by the mother. Later on, another similar case came under my observation, and five or six years ago, I reported a couple of cases, which I attributed to pressure on the cord by the lateral curvature. In these, however, the history obtained from the parents showed the presence of the incoordinate movements before the spine lesion was noted; and it is hard, I think, to see why a dorsal curvature would give incoordination in the upper extremities, the tremulous tongue and the symptoms mentioned, unless one is expecting a lesion of the upper cord as a consequence of the pressure at the point of twisting.

THE HEART AND ACTIVE SERVICE

TREATMENT OF CONVALESCENT SOLDIERS AT HEATON PARK *

H. J. SEEUWEN, M.D.

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MANCHESTER, ENGLAND

In January last, at a meeting of the Royal Society of Medicine, Sir James MacKenzie opened a discussion on the "Soldier's Heart." His paper was interesting, as was the discussion which followed. A few weeks afterward, Dr. R. N. Wilson, his assistant, paid a visit to our command depot at Heaton Park. He examined a great number of our men affected by heart troubles.

After his visit, Major R. Tait McKenzie arranged for me to give electrical treatment to a selected group of those men. I took some sixty of the most serious cases of heart troubles. All of these men were at the same time given daily open air exercises by Major McKenzie's method, which included gymnastic training and route marches.

The physical training includes two divisions, the light and the full training. The first consists of slow

* This paper was forwarded by Dr. R. Tait McKenzie (of Philadelphia), who is now a major in the R. A. M. C. He says that "Dr. Seeuwen was a prominent practitioner in Ostend and with his family has been living in Manchester until I was fortunate enough to secure him for my staff here."

movements of limbs and trunk, and some deep breathing exercises; in the second division we find all the movements much more vigorous, much quicker, and also running and jumping. For the route marches we have the light one, which is only a walk at an easy pace for about 2 miles; the full route march is a sharp walk, in quick time, for from half an hour to an hour, usually with a band of music.

I made a daily application with the faradic current, the only form of medical electricity for the time being at our disposition.

The history of most of these men corresponds closely with those related in the articles of MacKenzie, Wilson and others. Wounds (20 per cent. were wounded), shell shock, excessive work, exhaustion and nervous strain are common factors. Debility following infection by sore throats, measles, dysentery, typhoid and malaria were found in about 25 per cent.

When I carefully scrutinized all those young men's pathologic history I could in more than 50 per cent. trace some old standing lesions, or some weakness, or at least a want of energy of the heart. Some of them had suffered years before they enlisted from palpitation, or breathlessness, after any strong effort, such as a run, or emotional disturbance. Others had been suffering from attacks of rheumatism (with or without heart troubles); others had hyperthyroidism, and others had suffered habitually, in winter, from cold hands and feet or other vasomotor disturbances. I asked all those men if they could play football or other exhausting games before they enlisted. Only five or six out of the sixty men were athletes.

Another very important factor is the probability of infections by bad teeth. Out of those sixty men, only eight presented a healthy denture. Is this not one way in which we must expect to find a very frequent cause not only of "soldier's heart," but also of rheumatism, or what is commonly called rheumatism, of dysentery, typhoid, goiter, and many other infections which find a well prepared soil in bodies which have had digestive troubles through defective teeth? In those cases the alimentary tract is the first affected, but afterward the central nervous system suffers, and all kinds of nervous symptoms may well be produced.

Dr. Wilson called my attention to the great number of big necks presented by the men he examined. The thyroid gland is often hypertrophied (25 per cent. presented a big neck). Is it due to infection and autointoxication? In a great number of cases, I think it is. During some ten months, with Dr. A. E. Barclay in the Roentgen-ray department at the Manchester Royal Infirmary, I saw a great number of simple and exophthalmic goiters, and we found very few of those patients — nearly all women — with a healthy denture.

What about spirits and tobacco, of which Dr. Poynton spoke? I think in a few cases they may be adjuncts, especially tobacco used in cigarets when smoke is inhaled. Some of these boys are smoking and drinking more than they did before they were soldiers. Nevertheless only five out of the sixty men were smoking over an average of ten cigarets a day, and most of them smoked only half that quantity.

Here are the results obtained after two months of the above mentioned treatment:

All the men were put as soon as possible on daily light physical training and the light route march. Most of them could stand completely or partially both those exercises, whose duration was half an hour each.

CASE 1.—Private J—— had dysentery in Gallipoli. He was invalided, October 15, was in hospital for three and one-half months, and came in camp at the end of February. He was short winded; had palpitations—no valvular disease of the heart—pain over heart region; bad teeth; indigestion; pulse rate about 100. March 3, 1916, faradic treatment and light physical training were begun. The pulse rate was 92. March 24, he often had palpitation after physical training. April 5, the pulse rate was 80. April 13, the pulse rate was 76; the patient was still on light physical training. The general condition was good. He had had no palpitation for three weeks. April 25, the pulse rate was 76; it was decided to begin full physical training.

After four or six weeks when the man did not complain, and the heart trouble did not get worse, he was promoted to the full physical training and the full route march, whose duration is about the same as the light ones, except that the exercises are more severe and the march longer and faster.

All those men were examined very often during the exercises and also some hours afterward.

Ten per cent. of the patients could not stand the light exercises at all at first.

CASE 2.—Private H—— was in France for eight months and was invalided July, 1915, with palpitation, tachycardia and headache, pulse rate 120. He had now and then palpitation before enlisting and during training. After a shell burst, he got worse and worse. Electrical treatment without physical training was begun March 2, 1916, pulse 110. March 10, the pulse was 84. March 15, the pulse was 78. March 17, light physical exercises were begun. March 24, the pulse was 88. April 12, the pulse was 100. The patient was uneasy, had palpitation, could not stand the exercises and was excused all duties. April 26, the pulse was 90, but the patient felt better. He will be recommended for discharge.

Fifty per cent. could stand the light exercises but not the full. The other 40 per cent., by daily treatment, improved more or less quickly and could soon stand the full course of gymnastics and marching.

Those men who could not stand the exercise complained of excessive fatigue, of palpitations, of pain over the left chest, of breathlessness, and most of them presented a high pulse rate, often 30 or 40 more beats persisting one or more days afterward.

Some men who could stand the light exercises without any trouble were submitted again and again to the full exercises and each time the different symptoms came back.

CASE 3.—Private G——, aged 23, had an enlarged thyroid for years, bad teeth, chronic throat catarrh and tachycardia (140 pulsations). He was at Gallipoli. The hot climate and very hard digging day and night made him weak. After a severe bomb attack he fell unconscious for an hour and felt the first palpitation. Feb. 9, 1916, he began his treatment, light exercises and faradization. After three weeks he felt much better; there was no palpitation, and the pulse rate was 90. March 2, he had full physical exercises, and March 6, his pulse rate was 120. March 9 it was still 115, and the man complained of uneasiness and some palpitation. March 10, he was again on light exercises. March 17, the pulse rate was 88. March 23, the pulse rate was 72. April 1, we tried him again on full physical training. April 7, the pulse was over 100, and again there was uneasiness. April 18, he was recommended for a medical board, and was passed for home service, for which he is quite well fitted.

CASE 4.—Lance Corporal W——, invalided May 15, 1915, was in hospital four months with crushed head. He was in France for three months and invalided for heart trouble. Before he enlisted he had a big neck but no heart or chest troubles. He felt the first palpitations after two shell shocks, and was unconscious for a few hours. There were stammering and tremor. He had good teeth. There was no constipation. The pulse rate was 68. February 23, electrical treatment and light physical training were begun. March 13, still

on light training, the patient was improved; speech was much better and there was no palpitation. March 16, full physical training was begun. March 22, the pulse was still normal, but the patient complained of dizziness, headaches and palpitations. March 30, the pulse was 80. There was uneasiness. April 19, the pulse was 82. There was pain over the heart region after physical training or a full route march. April 26, the patient was on light physical training and light route marching; he felt better, and the pulse rate was 72. The man is to be recommended for home service.

The electrical treatment consisted of a daily faradization with a light current — of long wired coil — over the thyroid gland and the heart. This treatment is often used on the continent for exophthalmic goiter. It consists in an application with two tampons for three or four minutes on the thyroid, followed by three or four minutes with one tampon over the heart region, the other in the neck. This kind of current has a marked sedative action, but is only local. The static current may do as well and probably better. The static current is a first class tonic on the general nervous system, and local applications over the heart region may also be given through the static effluve or breeze.

Deep applications of the Roentgen rays on the thyroid gland may also be very useful, especially on those men with hypertrophied thyroids (25 per cent. out of the total). Dr. Florence Stoney has described this treatment, and obtains good results. Roentgen rays are certainly one of the best treatments we have now for exophthalmic goiter. Tachycardia, excessive sweating, and nervous uneasiness are the symptoms which are the most quickly and completely removed.

As the result of an average of two months' treatment, out of the sixty men, fourteen were quite fit and have returned to their unit; four others are fit and will return in a few days; others are on full physical training and will be fit in a short time; over a third, or 35 per cent., will be able to return to the firing line. From 10 to 15 per cent. have to be discharged; the other 50 per cent. of the men have improved and may be able to do home service.

These first results are very encouraging, and in the summer months I think we can do better. Outdoor life is easier; gardening, open air games, like bowling, quoits, rowing and swimming, may hasten the cure, while treatment with the Roentgen ray, static electricity, and also hydrotherapy will greatly augment our percentage of recoveries.

Heaton Park.

Microscopic Differentiation of the Meningococcus.—Gaudin called attention in 1914 to the presence in meningococcus colonies of short black lines represented by fine crystals. They may be grouped like a picket fence or in the shape of stars, or may lie separate. These crystals were found constantly in the true meningococcus cultures in the experience of Gaudin and Papin at the bacteriologic Institute at Angers, France. They found meningococci in 152 of the 735 suspected specimens sent in for examination, and this characteristic *piqueté* was unmistakable in all the cultures which other tests demonstrated to be meningococci, and none were ever seen in the other cultures, although all the Petri dishes were examined very carefully for them. The crystals were found in twenty-five or forty-eight hours; in a very few cases they were not evident until the third day. They may increase in size and number with time. The culture medium generally used was gelose-ascites or gelose-white of egg, but the crystals were found, whatever the medium, except in fluid mediums. Their report was published in the *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, 1916, xl, 1023. They say that the crystals can be seen with a comparatively low power microscope.

TRICHINOSIS

A STUDY OF FIFTEEN CASES *

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AND
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Clinical and pathologic observations during the past several years furnish convincing evidence that trichinosis is a common disease. The number of epidemics and the number of reported and unreported single cases, as well as the number of individuals associated or unassociated with epidemics presenting somewhat obscure abdominal, general muscular and facial symptoms (without blood or muscle examination) attest to this statement. The percentage of trichina findings in those dead of various disorders is surprisingly high, and in several series of unselected necropsy cases the percentage has varied from 0.5 to 5.4, the latter figure having been reported by Williams[1] in this country.

The life history of the parasite in the rat, hog and human being, including the effect of gastric secretions, the habits of the parasites in the intestines, and their blood dissemination and muscle deposition, has been exhaustively studied since the discovery of the importance of its human habitat in 1860. The experimental study in the smaller laboratory animals has not been neglected. Examinations of the blood, spinal fluid, feces and urine from the parasitic, bacterial and chemical standpoints have revealed much of interest in demonstrating extensive tissue invasion and a well marked metabolic disorder, incidental wholly or in part to the presence of an alien protein of catabolic origin, or suggestively, as shown in experimental animals, to secondary invasion of the system by bacteria.

The incubation period shows a wide variation. Accurate data often are difficult to obtain, and one cannot be certain of the time of infection. A large series of cases has been collected by Kratz, who found the incubation period in ninety-eight cases to be from one to five days, in seventy-six cases from six to ten days, in sixty-seven cases from eleven to twenty days, and in thirty-three cases from twenty-one to thirty-three days — the longest forty-two days. Herrick and Janeway,[2] in 1909, demonstrated the parasites in the circulating blood. Since that time several investigators have made similar demonstrations. Frothingham[3] has reported from the Boston City Hospital a case in which the parasites were found in the brain, liver, myocardium, mesenteric node, lung and pancreas. Van Cott and Lintz[4] were the first to demonstrate the parasite in the cerebrospinal fluid. Other demonstrations have been made by Bloch[5] (two), Elliott,[6] Young, Lintz[7] (three), and Cummins and Carson.[8] The small percentage of positive find-

* From the Southern Pacific General Hospital, Harriman Laboratory.
* Presented before the San Francisco County Medical Society, May 9, 1916.

1. Williams: Jour. Med. Research, 1901, vi, 64.
2. Herrick, W. W., and Janeway, T. C.: Demonstration of the Trichinella Spiralis in the Circulating Blood in Man, Arch. Int. Med., April, 1909, p. 203.
3. Frothingham, Channing: Jour. Med. Research, 1906, xv, 483.
4. Van Cott, J. M., and Lintz, William: Trichinosis, THE JOURNAL A. M. A., Feb. 28, 1914, p. 680.
5. Bloch, Leon: Trichinosis, THE JOURNAL A. M. A., Dec. 18, 1915, p. 2140; Illinois Med. Jour., May, 1916.
6. Elliott, A. R.: Trichinosis, THE JOURNAL A. M. A., Feb. 12, 1916, p. 504.
7. Lintz, William: Trichinosis and the Cerebrospinal Fluid, THE JOURNAL A. M. A., June 10, 1916, p. 1856.
8. Cummins, W. T., and Carson, G. R.: A Case of Trichinosis with Embryo in the Spinal Fluid, THE JOURNAL A. M. A., June 10, 1916, p. 1856.

ings in the feces leads one to believe that in most cases the parasites suffer disintegrative changes in their passage through the intestinal tract. Schleip noted splenic enlargement in thirty-eight of forty-six cases, but recent American reports do not show nearly so high a percentage. Flury and Groll[9] have shown experimentally that the urine presents evidences of disordered muscle metabolism with an early retention of nitrogenous products, followed by an abnormal excretion of ammonia, creatin, indican, lactic acid, fatty acids and purin bases. A positive diazo reaction is common. They ascribe the symptoms to two toxins, one which is elaborated by the parasite itself and the other which is produced by muscle disintegration, both acting on the muscular, nervous and vascular systems. Experimental observations would seem to suggest that bacterial invasion is responsible for fever and other evidences of disordered metabolism, but human trichinosis does not bear this out. A very few cases have shown on blood cultures an undoubted double infection, but a preponderance of negative results furnishes strong proof that the bacteremic theory cannot generally obtain. It is much more likely, according to Herrick,[10] that the fever is produced by an alien protein of parasitic and muscular origin. He has presented an excellent review of recent studies in trichinosis. One hundred and two case histories were reviewed by Minot and Rackemann[11] to determine the frequency of associated respiratory signs and symptoms. About one third showed abnormal physical signs in the lungs. The confusion of trichinosis with muscular rheumatism and typhoid fever is real.

PERSONAL OBSERVATIONS

Our fifteen cases, all of which were in laborers on the railroad, were admitted to the hospital within a period of two months. In most of our cases considerable difficulty was noted in eliciting information concerning pork. The first outbreak consisted of six cases (Cases 1-6) in members of an Italian section gang, all of whom, January 10, had eaten the same pork, which was admitted by the foreman to have looked diseased. One of these cases was fatal. The second outbreak consisted of five Greek section hands (Cases 7-11), all of whom, January 22, had eaten pork from animals killed by a train. Three Italian cases (Cases 12-14) were from the same gang but no data could be obtained in regard to a common infection. The last patient, an Italian, denied having eaten pork "for a long time."

Of the twelve cases with definite data, the average of the incubation periods was twenty and one half days. The temperature, total leukocytes and eosinophilia generally bore no relationship to the intensity of the affection as indexed by the degree of prostration, the degree and extent of muscular pains and duration of illness. The fatal case (Case 5) showed the highest temperature (105) and simultaneously the highest leukocytosis (28,800) late in the disease when thoracic symptoms were evident. The maximum leukocytosis and eosinophilia were about equally divided between the febrile period and that of convalescence. Two patients (Cases 2 and 14), in addition to the one who died, had for several days sanguineous sputum in which no parasites could be found. One sputum in Case 14 was loaded with eosinophils, when the blood eosinophilia was low; and when the bronchitis disappeared, the percentage increased about 10. This patient also showed subconjunctival hemorrhage in both eyes. The cough did not seem to be sufficiently severe to produce this condition. Splenic enlargement was not noted in any case. Blood cultures (extract broth) were made in seven cases during the period of highest temperatures, and all were negative. Case 11, in which the trichina embryo was found in the spinal fluid,* gave negative cellular and globulin findings. Case 10 gave a doubtful globulin reaction, and Case 2 showed 11 cells per cubic millimeter. The remaining nine cases showed negative spinal fluid. The urines in eleven cases were examined for parasites after the possibility of invasion of this tract, as well as the cerebrospinal axis, had been considered. All were negative. (Lintz[7] has found that the embryos are unaffected by normal urine.)

SUMMARY OF CASES

Case	Period of Incubation, Days	Orbital Edema	Eruption	Bronchitis	Muscular Soreness	Temperature Maximum	White Blood Cells, Maximum	Eosinophilia, Maximum %	Trichina* in					Urine Albumin
									Muscle	Feces	Blood	Spinal Fluid	Urine	
1	26	—	—	—	Slight	104	13,000	20	0	— (3)	— (3)	0	0	0
2	30	+	—	+	Extreme	104.8	19,700	70	+ (4)	— (2)	— (2)	— (5)	— (5)	—
3	17	+	—	—	Moderate	103	14,600	46	+ (4)	— (3)	— (3)	— (5)	— (5)	—
4	20	+	+	—	Moderate	102.4	23,500	24	+ (6)	— (2)	— (2)	— (5)	— (5)	—
5†	21	—	+	+	Extreme	105	28,800	61	+ (5)	— (2)	— (2)	0	0	+
6	19	+	—	—	Moderate	103.4	17,800	28	0	— (2)	— (3)	0	0	+++
7	30	+	—	—	Marked	104.4	21,600	46	+ (4)	— (1)	— (?)	— (2)	— (2)	Trace
8	20	—	—	—	Moderate	104.2	26,800	75	+ (4)	— (1)	— (1)	— (4)	— (5)	Trace
9	17	+	+	—	Marked	104	25,600	33	+ (4)	— (2)	— (2)	— (4)	— (4)	—
10	16	—	+	—	Moderate	103.8	12,400	33	— (6)‡	— (2)	— (2)	— (4)	— (4)	Trace
11	18	+	—	—	Moderate	104	13,400	52	+ (4)	— (2)	— (2)	+ (5)	— (5)	Trace
12	22	+	—	—	Slight	100.4	19,300	52	0	— (2)	— (2)	— (2)	— (2)	Trace
13	5?	+	—	—	Moderate	100.6	17,000	45	0	— (1)	— (1)	— (1)	— (1)	Trace
14	?	—	—	+	Moderate	104	16,100	18	0	— (2)	— (2)	— (2)	— (2)	+
15	?	+	—	—	Moderate	102	18,500	51	0	— (2)	— (2)	— (2)	0	Trace

* Figures in parenthesis indicate the week of the disease in which examinations were made.
† Fatal case. ‡ Interstitial myositis.

Patient 5 ate pork, January 10. The usual abdominal symptoms were complained of, January 31, and three days later he was admitted to the hospital. Physical examination was negative except for slight abdominal tenderness. The temperature was 99.4, leukocytes 10,000, eosinophils 2 per cent. Albumin was present in the urine, but there were no casts. Moderate tenderness of the calves and flexor muscles of the arms developed, and the case progressed favorably for nineteen days, when the morning temperature reached normal. That evening cough with blood-tinged sputum appeared. There was slightly increased tactile fremitus over the left base posteriorly, and roughened breath sounds all over the thorax, but no râles. Blood disappeared from the sputum on the following day, to reappear and con-

9. Flury: Trichinosis, Deutsch. med. Wchnschr., 1913, xxxix, 1388; Beiträge zur Chemie und Toxikologie der Trichinen, Arch. f. exper. Path. u. Pharmakol., 1913, lxxiii, 164. Flury and Groll: Stoffwechseluntersuchungen an Trichinosen Tieren, Arch. f. exper. Path. u. Pharmakol., 1913, lxxxiii, 214.
10. Herrick, W. W.: Review of Recent Studies in Trichiniasis, THE JOURNAL A. M. A., Nov. 27, 1915, p. 1870.
11. Minot and Rackemann: Am. Jour. Med. Sc., 1915, cl, 571.

tinue for several days, but the cough persisted and dyspnea progressively increased. The sputum showed a preponderance of pneumococci in four examinations. No parasites were found. Profuse sweats and extreme dyspnea were among the terminal symptoms. On the development of the thoracic symptoms the eosinophilia percentage progressively decreased from a maximum of 61 per cent. to 0, eight hours before death (a period of eleven days). Muscular soreness was well marked and generalized throughout the entire course of the disease, except for the last few days. Symptomatic therapy was carried out, including calomel, castor oil and salol.

Necropsy revealed an emaciated body. The anterior abdominal muscles were apparently normal. The peritoneum was congested and dry. The spleen was somewhat smaller than normal, and of soft consistency. The liver was enlarged and flabby, of typical nutmeg appearance, and the cut surface was yellowish. The gallbladder, stomach and intestines, including the appendix, were apparently normal. There was moderate congestion of the pancreas. Both kidneys were of normal size and of moderately increased cortical thickness. The right kidney was much congested, and near the inferior pole a triangularly shaped, yellowish, soft area was seen. The abdominal surface of the diaphragm showed several hemorrhagic areas. The left pleural sac contained 2,000 c.c. of purulent fluid. The lung was atelectatic. The right pleural sac showed no adhesions or fluid. The lung showed generalized edema except at the base, where there was consolidation. The visceral pleura showed numerous small hemorrhagic foci. There was moderate congestion of the parietal pericardium and moderate increase of clear yellow fluid in the sac. The heart was not opened. The mesenteric lymph nodes were not enlarged. The retroperitoneal group were somewhat enlarged, much congested and resembled hemolymph nodes. (The notes are condensed, as permission for only a partial necropsy was obtained.)

The pathologic diagnosis was: suppurative pleuritis; pulmonary atelectasis, edema, emphysema, hemorrhagic infiltration and hypostatic pneumonia; congestion of spleen; acute parenchymatous nephritis and anemic infarction; passive congestion and fatty degeneration of liver; congestion of pancreas; hemorrhagic infiltration and endothelial hyperplasia of retroperitoneal lymph nodes; hemorrhagic infiltration of diaphragm; *Trichina spiralis* in biceps, soleus, gastrocnemius and diaphragm. (No evidence of parasites in viscera or pleural fluid.)

SUMMARY

The average incubation period was three weeks. One third of the cases presented no orbital edema; three quarters, no eruption; four fifths, no bronchitis; none showed splenic enlargement. Eleven cases showed a disproportionately low pulse rate, to which little attention has been called. The maximum eosinophilia was 75 per cent. Of nine cases, eight showed trichinae in the muscles; of the fifteen cases, none were found in the blood or feces; of twelve cases, one showed an embryo in the cerebrospinal fluid; of eleven cases, none were found in the urine; of fourteen cases, ten showed albumin in the urine. The mortality was 6.6 per cent. The fatal case presented a hypostatic pneumonia and a large pleural effusion.

COMMENT

Evidently the parasites traverse the venous channels in very small numbers for mechanical reasons and probably none in some cases. It would appear that in many cases they suffer partial or complete disintegration in the intestinal tract. A routine spinal fluid examination may show that the nervous tissues are invaded in many instances; but it does not seem likely that this will serve as a useful diagnostic procedure in the study of the disease. If routine urinary examinations are made for parasites, it seems not improbable that invasion of this tract may be demonstrated.

New Instruments and Suggestions

ISO-AGGLUTINATION GROUPS

A DIAGRAM SHOWING THEIR INTERRELATION *

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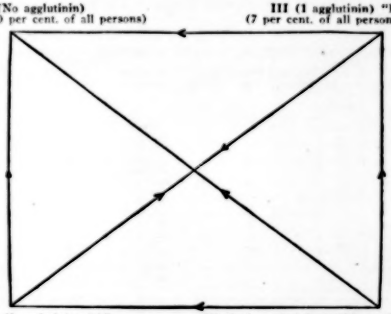
Recently Brem[1] has published a very comprehensive review of his results with his own practical application of Moss'[2] principles. It would seem futile to try to add any information to that presented. Our own experience with Brem's microscopic method has proved its worth conclusively as a time-saving procedure in determining the suitability of donors for transfusion. However, in explaining the Moss agglutination groups to clinicians, we have found that some confusion arises regarding the relation of the four groups unless a careful study has been made of Moss' tables, but that the principles are readily grasped by referring to the accompanying diagram.

The diagram explains itself. Lansteiner's[3] idea regarding the number of agglutinins is all that is necessary to explain the reaction, if we consider that the serum of Group II contains Agglutinin A and that of Group III contains agglutinin B, while Group IV contains both Agglutinin A and Agglutinin B. Group IV then agglutinates the corpuscles of Group II


I (No agglutinin)
(10 per cent. of all persons)
III (1 agglutinin) "B"
(7 per cent. of all persons)
II (1 agglutinin) "A"
(40 per cent. of all persons)
IV (both agglutinins) "A" + "B"
(43 per cent. of all persons)

Moss Agglutination groups: The corpuscles of the various groups are agglutinated by the serums of the groups from which the arrows lead.

by virtue of its Agglutinin B, and its Agglutinin A acts on the corpuscles of Group III.

Ottenberg's[4] well known grouping can be applied to the same diagram by merely exchanging the numerals I and IV, as his Group I agglutinates all corpuscles, and there is no agglutinin in his Group IV.

It is preferable but not always necessary in transfusion that donor and recipient belong to the same group. The essential for safety is that the serum of the recipient should not agglutinate the corpuscles of the donor. The diagram tells at a glance to what group a person must belong in order to be a suitable donor for an individual of another group. If the arrow points toward the patient's group, and away from the group of the donor, the transfusion may be done without what Brem has called "anaphylactoid" reaction. It must always be remembered that on the diagonal connecting Groups II and III the arrows point in both directions, and that blood in these reciprocal groups should never be inter-

* From the Mayo Clinic.

1. Brem, W. V.: Blood Transfusion, With Special Reference to Group Tests, THE JOURNAL A. M. A., July 15, 1916, p. 190.
2. Moss, W. L.: Studies on Isoagglutinins and Isohemolysins, Bull. Johns Hopkins Hosp., 1910, xxi, 63.
3. Lansteiner, K.: Ueber Agglutinationserscheinungen normalen menschlichen Blutes, Wein. klin. Wchnschr., 1901, xiv, 1132.
4. Ottenberg, R.: Studies in Isoagglutination, Jour. Exper. Med., 1911, xiii, 425.

changed. It is evident, then, that 100 per cent. of persons can be used as donors for patients of Group I, 83 per cent. for those of Group II, and 50 per cent. for those of Group III. For those of Group IV, only 43 per cent. are available as donors, as a patient of this group must have a donor of the same group.

A SIMPLE METHOD FOR THE DETERMINATION OF NITROGEN IN URINE *

R. B. H. GRADWOHL, M.D., AND A. J. BLAIVAS, ST. LOUIS

This is a slight modification of the method given by Myers and Fine, which, in turn, is a modification of the colorimetric method of Folin and Farmer.[1] The only difference in technic is that of adding hydrogen peroxid to hasten oxidation, which considerably shortens the time of making the test. In the method of Myers and Fine, fully fifteen to twenty minutes is required to complete the determination. As here described, the estimation may be completed in from five to ten minutes.

In the method as described by Myers,[2] for the determination an amount of urine sufficient to contain between 0.35 and 0.75 mg. of nitrogen is required. This is usually obtained by a 1:25 dilution of urine, although sometimes a dilution of 1:10 is sufficient, as indicated by a low specific gravity. One

TABLE FOR THE ESTIMATION OF NITROGEN WITH THE HELLIGE COLORIMETER

Colorimetric Reading	Nitrogen, Mg. per Dilution of 100 c.c.	Colorimetric Reading	Nitrogen, Mg. per Dilution of 100 c.c.	Colorimetric Reading	Nitrogen, Mg. per Dilution of 100 c.c.
20	1.73	40	1.31	60	0.89
21	1.71	41	1.29	61	0.87
22	1.69	42	1.27	62	0.85
23	1.67	43	1.25	63	0.83
24	1.65	44	1.23	64	0.81
25	1.62	45	1.20	65	0.78
26	1.60	46	1.18	66	0.76
27	1.58	47	1.16	67	0.74
28	1.56	48	1.14	68	0.72
29	1.54	49	1.12	69	0.70
30	1.52	50	1.10	70	0.67
31	1.50	51	1.08	71	0.65
32	1.48	52	1.06	72	0.63
33	1.46	53	1.04	73	0.61
34	1.44	54	1.02	74	0.59
35	1.41	55	0.99	75	0.56
36	1.39	56	0.97	76	0.54
37	1.37	57	0.95	77	0.52
38	1.35	58	0.93	78	0.50
39	1.33	59	0.91	79	0.48

c.c. of urine is taken with an Oswald-Folin pipet and diluted to 25 c.c. with distilled water in a volumetric flask. After thorough mixing, 1 c.c. of this material is placed in a thin glass test tube, from 5 to 7 drops (0.1 c.c.) of concentrated sulphuric acid, from 50 to 100 mg. of potassium sulphate and a drop of copper sulphate (10 per cent.) added. The tube is now boiled by hand with continued shaking until the contents become dark brown, and then, while the tube is warm (not hot), a drop of hydrogen peroxid is added, and if not clear, it is heated about one minute until clear. It is this part of the technic that we have modified, namely, the addition of hydrogen peroxid. When digestion is completed, the tube is allowed to cool for a minute and then washed into a 50 c.c. volumetric flask or accurate 50 c.c. graduate (A) with about 35 c.c. of distilled water. Five c.c. of ammonium sulphate solution containing 1 mg. of nitrogen per 5 c.c. is pipetted with an Oswald-Folin pipet into a 50 c.c. volumetric flask (B); the Hellige colorimeter is to be employed and about 30 c.c. of distilled water added. Ten c.c. of the modified Nessler's solution are diluted with 40 c.c. of distilled water just previous to use, mixed, and the material in the second volumetric flask, standard, at once made up to volume with the diluted Nessler's solution. The solution in Flask A, unknown, is then made up to volume with the diluted Nessler's solution as in Flask B, except that the Nessler's solution is added slowly at first while rotating the flask, until the alkali of the Nessler's has neutralized the sulphuric acid. A dry, glass-stoppered wedge for the Hellige colorimeter is filled with the standard solution and adjusted in the colorimeter. Slightly over 2 c.c. of the unknown solution are then next placed in the empty cup, inserted into the colorimeter and the colors matched, preferably with a north light. The amount of nitrogen in $\frac{1}{20}$ c.c. of urine may be ascertained in the accompanying table, from which the nitrogen content of the specimen of urine under examination may easily be computed. Since the figures in the table are given for a dilution of 100 c.c., and the dilution here employed is 50 c.c., the result obtained should be divided by 2.

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* From the Chemical Laboratory of the Pasteur Institute of St. Louis.

1. Folin and Farmer: Jour. Biol. Chem., 1912, xi, 493.
2. Myers: Essentials of Pathological Chemistry, 1913.

Therapeutics

HYPERTENSION

(Continued from page 745)

TREATMENT

In this rapid high tension age the physician should be as energetic in teaching prevention of arterial hypertension as he is in preventing contagion. As infectious diseases are reduced in frequency, more patients live to die of diseases later in life, and (as previously stated) diseases with hypertension are on the increase. It is therefore the duty of the physician to urge youths and adults to abstain from all kinds of excesses so common in this age. We live at such speed, even the children, that this caution is almost daily needed. We must caution against severe athletic competition, against personal "stunts," against recreation excesses, even golfing, automobiling and dancing, against excess in the use of tobacco, in eating, in late dinners, in coffee, tea and alcohol. We must take better care of patients during their convalescence from some serious illness lest they have circulatory debility by becoming strenuous too soon after their recovery. The pregnant woman must be more carefully watched, not only for her own sake, but also for the sake of her child. Intestinal indigestion, while not the cause of all disturbances that occur in man after 40, is still an important element in his deterioration and degeneration, and it should be prevented if possible.

The tendency for hypertension and arteriosclerosis to occur early in life in patients who have suffered some serious acute infection, whether blood poisoning, typhoid fever, or other, shows that in all probability in these acute illnesses the internal secretions are so disturbed that the suprarenal activity is greater than normal, while the thyroid activity may be less than normal, and hypertension is the consequence. Therefore, these infected patients who recover should probably have a longer convalescence in order for the more delicate structures of the body, such as the internal secreting glands, to have a better chance to recover and become normal.

The enumeration of these causes and the causes that have been mentioned before not only suggest, but also direct the treatment of hypertension after it has occurred. The most important of all treatment for hypertension is rest. That means for an individual, well except for his hypertension, a vacation, that is, a rest from physical and mental labor. For a patient who is in serious trouble from hypertension, bed rest is the most important element in the management. As has

been previously shown, good sleep lowers the blood pressure, and Brooks and Carroll[59] showed that the greatest drop in blood pressure occurs in the first part of the night's sleep. In other words, a patient who lies awake long loses the best part of his night's rest as far as his circulation is concerned. This is one more reason for abstinence from tea and coffee in the evening by those patients who are at all disturbed by the caffein. On the other hand, patients who are not seriously ill should not remain for days in bed, as the blood pressure does not tend to continue to fall, although the heart may become weakened by such bed rest. This is especially true if the patient is nervous and irritable and objects to such confinement.

A systolic pressure much over 200 probably never goes down to normal, and if such a high systolic pressure goes down to below 170, we should consider the treatment successful.

Every active treatment of hypertension should begin with a thorough cleaning out of the intestinal canal by purgation, best with mercury in some form. Then the diet should be modified to meet the individual case and the person's activity. If the blood pressure is dangerously high, he should receive but little nourishment, best in the form of cereals and skimmed milk.

On the other hand, if he has edema or dropsy, or if the heart showed signs of weakness, large amounts of liquids should certainly not be given, and in such cases it is better that he receive small quantities of milk if that agrees, rather than large quantities of skimmed milk. The amount of water should also be fitted to the circulatory ability and the condition of the kidneys.

When more or less active treatment does not soon lower the hypertension, and especially a high diastolic pressure, the prognosis is bad. In a patient who is in more or less immediate danger from his hypertension, the food and liquid taken, the care of the bowels, and the measures used to cause secretions from the skin must all be governed by the condition of his other organs. There is no excuse for excessive, strenuous measures when the heart is failing or when the kidneys are becoming progressively insufficient. Strenuosity in treatment is as objectionable in these cases as is neglect of treatment in earlier stages of the trouble.

Bie[60] believes there is no direct connection between the blood pressure and the anatomic condition in the kidneys, although abnormal conditions in the two are almost invariably found parallel.

A patient with simple hypertension and otherwise well, which means that his diastolic pressure is at least no higher than 110, should have his diet, tobacco, coffee and tea regulated; should have recreation periods one or more times a week, and vacations not too infrequently; should take some brisk purgative once or twice a week, and may receive one or other of the physical treatments for the reduction of blood pressure, whether Turkish baths or electric light baths. If he does not sleep well, there is no hypnotic drug so valuable in his case as chloral. This should not be long given, but it will produce the purest kind of sleep and lowers the blood pressure.

If any other drug is needed, nitroglycerin is the best. If arteriosclerosis is present, sodium iodid in small doses, 3 grains two or three times a day, is valuable. Larger doses of sodium iodid are not needed, unless it is advisable to give such doses for a short period. The value of iodid in these cases is best obtained by small doses long continued. If the patient is obese, small doses of thyroid extract long continued are of value, such as 2 or 3 grains once a day. If the thyroid extract causes the heart to become more rapid, it should be discontinued.

Whether the diet should be meat protein free, or whether meat may be allowed once a day, depends entirely on the individual and on his physical activities. It is frequently a mistake to take all meat out of his diet.

When there is obesity, the bulk of the food should be greatly diminished, and anything that tends to stimulate the patient's appetite should be withheld. This means all condiments, and at times even salt. Sugar should be greatly reduced, and starches greatly reduced, but he must have some. In other words, he should not be cut down to a diabetic diet. No more liquid should be taken with the meals than is essential to swallow the food. Water should be taken between meals. There is no question that almost every one today should have a very light breakfast, except perhaps those who labor hard physically and are exposed for hours, daily, to the inclemencies of the weather. Such patients probably need more food. It is also well, in hypertension cases, to have one day a week in which a very minimum amount of food is taken, whether that be milk, or skimmed milk, or a small amount of carbohydrate, without protein food.

If the foregoing management does not reduce hypertension, the kidneys are generally beginning to become involved in the sclerotic degeneration, whether the urine shows such a condition or not. On the other hand, there are exceptions to this rule.

As indican in the urine gives evidence of putrefactive changes in the intestines and the probability of the absorption of toxins from the intestines, although we have no real proof that these toxins are the direct cause of hypertension, our patient is undoubtedly physically better, and will have less arterial tension when this intestinal condition is removed. Therefore, our treatment of the individual is not a success as long as such fermentation and putrefaction persist. If such putrefaction cannot be removed by diet and laxatives and mental rest and the prevention of physical strenuosity, radical changes in diet are advisable, although it may not be necessary to continue such a diet more than a few days at a time. A rigid milk diet for a few days may change the flora of the intestine completely; then a vegetable diet may be given, with return to a mixed diet; or the various lactic acid bacilli may be given, or one of the various fermented milks may be the diet, the object being to change the flora in the intestine and thus modify the ferments. So-called bowel antiseptics, such as salol, for a short time may be of advantage. Colon washings may be of great advantage. Liquid petroleum may be advantageous.

Besides preventing the absorption of toxins from the intestine, we must prevent such absorption from any latent infection. The most frequent kind of such infection is pyorrhea alveolaris.

A simple method that sometimes is an efficient aid in lowering the blood pressure is complete muscular and mental relaxation. The patient lies down for a while in the middle of the day and relaxes every muscle of his body. With this he may take slow breathing exercises. He should be in a dark room, quiet if possible, and alone, and should teach his brain to be for a short time mentally inert.

59. Brooks, Harlow, and Carroll, J. H.: A Clinical Study of the Effects of Sleep and Rest on Blood Pressure, Arch. Int. Med., August, 1912, p. 97.

60. Bie: Ugesk. f. Læger, March 4, 1915.

The physical methods of lowering the blood pressure are hydrotherapeutic, whether by warm baths or more strenuously by Turkish baths, by hot air baths (body baking) which is occasionally very efficient, or, perhaps more now in vogue, by electric light baths. The duration of these baths, and the frequency, must be determined by the results. If the heart is made rapid, and the heart muscle shows signs of weakness, the duration of these baths must not be long, and they may be contraindicated. These baths are most efficient in lowering the blood pressure when the patient reclines for several hours after the bath. The amount of sweating that is advisable in these cases depends on the condition of the heart. If the heart muscle is insufficient, profuse sweating is inadvisable. Also if the kidneys are insufficient, profuse sweating is inadvisable as tending to concentrate the toxins in the blood. On the other hand, when the surface of the body tends to be cool, and there are internal congestions, the value of these baths is very great. Sometimes the electric light baths increase the tension instead of diminishing it, and when properly used they may be of benefit in some cases of hypotension. The frequency of the baths and the question of how many weeks they should be intermittently continued, depend on the individual case. After a course of such treatment sometimes patients have a diminished systolic blood pressure not only for weeks, but even for months, provided they do not break the rules laid down for them.

The Nauheim baths, while stated not to raise the blood pressure, are not much advocated in hypertension, and Brown,[61] who made more than 500 observations of patients of all ages, found that the full strength Nauheim bath would raise the blood pressure in all feverish and circulatory conditions. He also found that a fifteen minute sodium chlorid bath, 7 pounds to 40 gallons, at a temperature of from 94 to 98 F., lowered the pressure from 10 to 15 mm. This is not different from the effect obtained from a fifteen minute warm bath at from 94 to 98 F., or a fifteen minute mustard bath of the same temperature. In other words, the slight irritation of mustard or of salt in a warm bath made no special difference in the amount of lowering of the blood pressure. On the other hand, he found that a fifteen minute calcium chlorid bath, 1½ pounds to 40 gallons, at 94 F., raised the blood pressure 15 mm.

The autocondensation treatment to lower the blood pressure is not so satisfactory as it was hoped to be. The blood pressure can thus be lowered, but it soon again rises, and probably generally more rapidly than after the bath treatments, and in some persons causes considerable depression. Van Rensselaer[62] has reviewed this subject of high frequency treatment, and recalls the fact that Nicola Tesla demonstrated, in 1891, the form of electricity which we now term high frequency. High frequency means more than 10,000 cycles per second, at which frequency muscles do not contract and pain is not felt, whereas in medicine the frequency of the currents used runs up into the hundreds of thousands, or even into the millions. The French investigator, d'Arsonval, studied the physiologic action of these high frequency currents and found that the respiration and heart are made more rapid and the blood pressure is reduced, while the intake of oxygen is increased and the carbon dioxid excretion is increased. The temperature may rise. The excretion of the urinary solids is mostly increased. Perspiration may be caused, and he believes the glandular activities are increased. In a word, metabolic changes in the body are made more active and the blood pressure is lowered.

Besides the effect of altitude on blood pressure, as previously declared, patients with dangerously high blood pressure should, if possible, not be subjected to intense cold. In other words, a person with hypertension, if financially able, should not remain in a cold climate during the winter. On the other hand, even if he is stout and feels sufficiently warm with light clothing during the winter, his skin becoming chilled adds to his tension. Therefore he should be clothed as warmly as he will tolerate.

After a period which may be termed the normal period of hypertension in normal life, as age advances the systolic tension may lower, provided there is no kidney lesion. This is due to the slowly developing chronic myocarditis and a lessening of the tension and therefore lessening of the resistance to the heart. This may be nature's method of lengthening the life of the individual. In other words, as the arteries grow older the force of the heart slightly lessens, the blood pressure lowers, and the individual is safer. This frequently occurs in otherwise perfectly normal individuals, without treatment.

When the blood pressure is suddenly excessively high from any cause, venesection may be life saving, and should perhaps be more frequently done than it is. It may save a heart that is in agony from tension, and may prevent an apoplexy. It is of little value except temporarily in uremic conditions, but at other times it may, at the time, save life and allow other methods of reducing the dangerous tension to become effective. A chronic high tension patient may be repeatedly bled, although such treatment will not long save life, as the blood pressure in many such cases soon returns to its previous height.

Some very high tension cases, especially in women at the menopause, and where there is no kidney involvement, have the blood pressure reduced successfully only by large doses of thyroid, sometimes well combined with bromids, especially if the thyroid causes excitation. Such treatment persisted in for a time may cause months of improvement, and even years.

(To be continued)

61. Brown: California State Jour. Med., November, 1907, p. 279.
62. Van Rensselaer: Month. Cycl. and Med. Bull., November, 1912, p. 643.

Eclampsia in Porto Rico.—J. S. Belaval reported recently to the Porto Rico Medical Association that he had found albuminuria in 20.3 per cent. of the 462 obstetric cases during the last thirty months at the San Juan Maternity. Eclampsia developed in 7.3 per cent. of the 462 obstetric patients. He cites figures from other countries showing that the proportion of eclampsia cases averages from 0.5 to 0.75 per cent. elsewhere. In the entire city of San Juan there were only six other cases of eclampsia known during the same period, and throughout the island the proportion was only 1 to 1,044 deliveries. In San Juan it averaged 1 to 420, but the patients were almost exclusively of the poorer classes, lacking medical care until the convulsion developed. In the maternity the mortality was 29.4 per cent., but outside of it, 60 per cent. He is an advocate of prompt delivery when eclampsia develops, but this occurred spontaneously in all his cases. (*Boletin de la Asociacion Medica de Puerto Rico*, 1916, xiii, 68). He agrees with those who accept a fetal origin for the eclampsia, because it generally improves after expulsion of the fetus, is most common during the later months of a pregnancy, and because it is proportionately more common in twin pregnancies and in cases of hydramnion.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street . . . Chicago, Ill.

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

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SATURDAY, SEPTEMBER 9, 1916

THE ORIGIN OF THE BILE PIGMENTS

Evidence has recently accumulated which places certain features of the origin and functions of the bile in a new light. Inevitably one associates the production of the characteristic biliary constituents — the pigments and the bile salts — with the activity of the liver. This organ has been looked on as the chief place of disintegration of hemoglobin in the body; or at any rate hemoglobin formed by dissolution of erythrocytes is believed to be brought to the liver, there to be converted into the iron-free bile pigments, bilirubin and biliverdin. Many observations seem to speak in favor of this. Injection of hemoglobin into the circulation, for example, causes increased secretion of bile pigment.

There are accumulating evidences, however, that the biliary pigments may be formed in the body elsewhere than in the liver. The most recent indications in this direction are the observations of Whipple and Hooper.[1] Thus they have noted that after intravenous injections of hemoglobin solutions in the form of hemolyzed erythrocytes, the transformation of the blood pigment into bile pigment occurred quite as well in animals in which the circulation of the liver was largely sidetracked by means of an Eck fistula as it did in normal subjects. The formation of bile pigment also occurred on removal of the liver, spleen and abdomen from the circulation, as well as by circulation of blood through the head and thorax. To account for this the experimenters suggest the possibility that the endothelial cells are here active, so that the transformation of hemoglobin can take place even without the medium of the hepatic tissue. Hooper and Whipple[2] have further found that the pleural and peritoneal cavities can rapidly transform hemoglobin into bile pigment. They believe, indeed, that this extrahepatic transformation of the blood pigment into its biliary derivative may be more important than is generally supposed, particularly in diseased conditions associated with icterus or hemoglobinuria.

One might now be inclined to inquire, in view of all the facts presented, whether the bile pigments are only eliminated by the liver, or whether they are also formed in it. But, further than this, recent researches have given justification for the question whether the production of bile pigments as a rule is not in part due to the functional activity of the liver and not solely dependent, as is so generally taught, on the breaking down of red corpuscles. In an exceptionally careful and extensive series of experiments at the George Williams Hooper Foundation for Medical Research at the University of California Medical School, Whipple and Hooper[3] have observed that variations in the character of the diet provoke unexpected changes in the output of biliary pigment in the bile. Thus a large dose of sugar by mouth will give a constant reaction in a healthy dog with a bile fistula. It will cause a definite increase in bile pigment excretion over a period of several hours. The same rise in the curve of bile pigment elimination follows intravenous injection of dextrose. A mixed diet in a healthy bile fistula dog is associated with a fairly constant mean bile pigment elimination. A change to a meat diet will give a depression of this average bile pigment elimination. A change to a diet rich in carbohydrates will give a sharp rise in bile pigment output — often from 30 to 100 per cent. increase. Such modifications of bile pigment elimination may be carried on indefinitely with a healthy animal.

Do not such facts contradict the current hypothesis concerning the exclusive origin of the bile pigments from hemoglobin liberated by the disintegration of red blood cells? As Whipple and Hooper put it: Can one assume that a carbohydrate diet will cause the dissolution of a small army of red blood cells to explain the fact that the output of bile pigment may be almost doubled in a sharp transition from a meat diet to a diet rich in carbohydrates? This seems improbable, to say the least. The fact that carbohydrates stimulate the excretion of bile pigments in bile fistula dogs makes it seem possible that the bile has some constructive ability in pigment formation which can be modified by diet. Whether it is also concerned in the synthesis of other pigments than bilirubin — for example, hemoglobin — need merely be suggested without an attempt at an answer at present.

The statement has been made at various times that bile secretion is not essential to health in man. The newest investigations of Whipple and Hooper[3] suggest caution if not actual skepticism in relation to such pronouncements. In their large experience it has been found that it must be very unusual for a dog to be able to survive on any ordinary diet if the bile is completely excluded from the intestine. If such exclu-

1. Whipple, G. H., and Hooper, C. W.: Jour. Exper. Med., 1913, xvii, 612. MeNee: Jour. Path. and Bacteriol., 1913-1914, xviii, 325.
2. Hooper, C. W., and Whipple, G. H.: Jour. Exper. Med., 1916, xxiii, 137.
3. Hooper, C. W., and Whipple, G. H.: Bile Pigment Metabolism, I, Bile Pigment Output and Diet Studies, Am. Jour. Physiol., 1916, xl, 332. Whipple, G. H., and Hooper, C. W.: Bile Pigment Metabolism, II, Bile Pigment Output Influenced by Diet, Am. Jour. Physiol., 1916, xl, 349.

sion is accomplished, the animal loses ground steadily, shows intestinal disorders accompanied by blood in the feces, and usually within a month dies with peculiar symptoms of intoxication. Feeding of fresh bile seems to afford little amelioration of the disaster; but cooked liver added to the mixed diet seems to be so beneficial that the question of its possible use in certain clinical cases is at once suggested. A more extended investigation may throw some light on the chemical character of the liver component responsible for this corrective influence on the abnormal metabolism of animals carrying a biliary fistula.

PROTOPLASM AND MITOCHONDRIA

Living matter differs from artificial mixtures of various compounds, such as proteins, fats, carbohydrates, salts and water, which it is known to contain, in particular by the peculiarity of having a definite physical structure. A complete destruction of this morphologic make-up means the cessation of life phenomena. A group of cells ground to a pulp may still be able to exhibit certain chemical reactions, such as the enzymic responses characteristic of the original tissues which they compose; but the significant biologic functions of the disintegrated cells can no longer be performed. To quote Jacques Loeb, "Living matter seen through the microscope invariably offers the same characteristic appearance which has caused biologists to designate it with one general term, namely, protoplasm."

What the actual detailed physical features of this structural basis of life, the protoplasm, are still remains largely a matter of conjecture. Some authors have looked on it as a network of fine fibers. To this the objection has been raised that the intracellular structures of various kinds, networks, alveoli, etc., can be produced by the fixing reagents which histologists are wont to use. According to such an interpretation, these structures have no resemblance to the living condition. They must be produced from cell constituents already present, so that certain conclusions are admissible from the examination of fixed cells. Protoplasm in the living state, the physiologist Bayliss writes, has the properties of a liquid system, containing, however, particles of solids and droplets of immiscible liquids in a freely movable state. The protoplasm itself in the narrower sense is structureless to the highest powers of the microscope, with ordinary forms of illumination. Yet it is not homogeneous like water; for, under the intense oblique illumination of the ultramicroscope, protoplasm presents the characteristics of a colloidal system.

Schultze long ago defined protoplasm as a glasslike, semifluid material in which granules are embedded. Attention has been directed of late to a class of granulations which are believed to be more or less distinct chemically, morphologically and physiologically, and which occur in almost all protoplasm. They have been termed "mitochondria."[1] These structures are not fixed, in their morphologic characteristics. They vary in form from granules (of from 0.2 to 2 microns) to rods and filaments, which may be straight, curved or even forked. Sometimes they are ring-shaped or pear-shaped, and possess bleblike swellings. Networks rarely occur. To M. R. and W. H. Lewis[2] of the Johns Hopkins University is credited the observation of changes in form in individual mitochondria by observations of living cells in tissue cultures. Filamentous mitochondria have been seen changing to granular ones; they can move rapidly and freely from place to place in the cytoplasm.

Mitochondria have been defined provisionally by Cowdry[1] of the Anatomical Laboratory of the Johns Hopkins University as "substances which occur in the form of granules, rods and filaments in almost all living cells, which react positively to janus green and which, by their solubilities and staining reactions resemble phospholipins and, to a lesser extent, albumins." From this description it becomes clearer why, despite the enormous amount of detailed attention which has been devoted to the study of cell structure for many years, so little has been heard of these supposedly important and conspicuous components. One reason apparently lies in the fact that, being lipoidal in nature, the mitochondria are disintegrated by the more common organic histologic reagents. Furthermore, we are reminded that the cell nucleus with its significant chromatin has remained the center of investigation for a long time, particularly since it has been designated as the most important structural feature of the cell.

The wide occurrence of these lipoid-protein cytoplasmic components, their apparent quantitative variations in different types of cells and under varying functional states, and their alleged metamorphoses of form in the course of cellular life suggest that the mitochondria participate in some way in cellular metabolism. The possible bearing on cellular pathology of these particles representing complexes of substances in various states of aggregation, associated perhaps by forces of surface tension, electric charge, etc., and shifting with chemical changes in their environment, is indicated by a quotation from Cowdry:

> It is impossible to predict whither this mitochondrial work will lead us in pathology; certainly, however, toward a truer appreciation of the importance of the behavior of protoplasm in pathological conditions, because now we have a cytoplasmic criterion of cell activity as well as a nuclear one.[1]

At any rate, such enthusiasm may contribute to the revival of interest in protoplasm, already evident in the more recent investigation of the survival of isolated tissue cells.

1. The essential facts in regard to mitochondria are taken from the paper by Cowdry, E. V.: The General Functional Significance of Mitochondria, Am. Jour. Anat., 1916, xix, 423.
2. Lewis, M. R., and Lewis, W. H.: Mitochondria in Tissue Cultures, Am. Jour. Anat., 1915, xvii, 339.

DIET, ALCOHOL AND ACIDOSIS

The phenomena of acidosis have been studied, as a rule, either in animals subjected to experimental conditions which evoke the desired symptoms, or in human patients in whom they are present as the result of disease. This has been true notably in diabetes, a condition which, of course, cannot be temporarily reproduced at will in man. The presence of severe acidosis with manifestations of ketonuria is not entirely devoid of discomfort to the subject, thus furnishing an additional reason for the lack of extensive data on the controlled production of the disorder. Ketonuria characterized by the elimination of acetone and aceto-acetic acid has long been recognized as a symptom of inanition. Complete abstinence from food is not necessary for the production of this condition. It is generally admitted that in man the exclusion of carbohydrates from the food or a marked diminution of their intake or utilization may lead to more or less increased elimination of ketone substances with a consequent acidosis. Inasmuch as this outcome is promptly stopped by the administration and assimilation of carbohydrate food, the carbohydrates are properly regarded as "antiketoplastic" or "antiketogenic" compounds. Other substances, including alcohol and compounds believed to be converted into sugar in the body, are said to act in the same way.

There has been much confusion in the literature regarding the detailed manifestations of the form of acidosis just described, in part owing to its usual association with metabolic disease, and in part as the result of apparent experimental contradictions obtained with animals of different species. For this reason it is most advantageous to have a new series of carefully conducted investigations on normal men under conditions of rigorous scientific control. Combining the facilities of the nutrition laboratory of the Carnegie Institution in Boston with the medical clinic of the Peter Bent Brigham Hospital, Higgins, Peabody and Fitz[1] have studied the production of acidosis induced in normal persons by carbohydrate starvation, as exemplified on a diet of eggs, butter, meat, fish and sugar-free cream fed in abundance. The high content of fat in the carbohydrate-free ration was selected with the idea of provoking a high degree of acidosis. For the present the fats are considered as the most important sources of the ketone substances of an acid character.

What criteria, it will at once be asked, were employed to demonstrate the actual occurrence and the degree of acidosis? The best single index at the present time presumably is the carbon dioxid tension of the alveolar air. This gives a clue to the amount of acid in the blood at any given time, and is independent of its excretion. In the cases under consideration, in which the carbohydrate diet was continued several days, the acidosis was clearly shown by a lowered carbon dioxid tension. There was likewise an increased urinary excretion of ammonia, another factor conspicuous in the neutrality regulation of the organism. Furthermore, along with the increased excretion of ketone substances, that is, ketonuria, there was a parallel excretion of acid as measured by the titratable acidity of the urine.

The foregoing facts may be taken to establish the character of the acidosis developed by carbohydrate starvation on an otherwise adequate diet. It was attended by subjective effects, among which "loss of appetite, lack of energy, heaviness of the head and a peculiar feeling of malaise" were the most prominent symptoms. Increased oxygen consumption, a negative nitrogen balance, increased pulse rate and increased pulmonary ventilation were further observed.

Contrary to the expectations from some of the published investigations, alcohol, given to the subjects on the carbohydrate-free diet, in dosage comparable to that used for clinical purposes, failed to stop the progress of the acidosis or show any antiketogenic action. The Boston investigators agree in finding that coincident with the administration of alcohol there was further increase in the oxygen consumption and in the disagreeable subjective symptoms. It was thus without apparent effect, at any rate, on the acidosis induced in normal subjects by taking a carbohydrate-free diet. All the symptoms were promptly alleviated, and the subjects began to feel much better immediately after the first carbohydrate meal was again eaten. The contrast was most striking, and is not without interest in relation to the much discussed food value of alcohol.

1. Higgins, H. L.; Peabody, F. W., and Fitz, R.: A Study of Acidosis in Three Normal Subjects with Incidental Observations on the Action of Alcohol as an Antiketogenic Agent, Jour. Med. Research, 1916, xxxiv, 263.

THE FOOD CONSUMPTION OF ADOLESCENT BOYS

Statistics of the food consumption of normal adults are available in large numbers, particularly since the modern era, in which a profound interest in the problems of human nutrition has begun to engross the attention of physiologists. The recent trend of interest in the subject of infant feeding has also brought with it illuminating data regarding the needs of the human individual in the early periods of life. Pediatric literature is not devoid of well established facts respecting the caloric requirement of the infant; but there is a singular dearth of statistics pertaining to the actual food intake and consequent dietary habits of young boys and girls. Indeed, both the physiology and pathology of the adolescent period offer abundant opportunity for the extension of knowledge.

Somehow it is difficult and unusual to collect the basic facts regarding the functional needs and performances in this period of youth. Du Bois has shown, by accurate measurements in the respiration calorimeter at the

Russell Sage Institute of Pathology, that the basal requirement of boys in metabolism is 25 per cent. above that of the adult. A recent investigation by Gephart of the same laboratory[1] affords an insight into the actual amounts of nourishment taken by more than 300 boys in one of the largest private boarding schools in the United States. The total animal supply for such an institution containing 355 boys was computed as follows, in metric tons:[2]

	Protein	Fat	Carbohydrate
Food supply	20.5	25.6	60.5
Waste	3.8	5.4	4.2
Food fuel	16.7	20.2	56.3

The quantity of food, computed on the basis of the individual meal served, appears as follows:

	Pounds	Grams	Calories	Calories (Per Cent.)
Protein	0.1107	50.2	206	14*
Fat	0.1332	60.4	562	39
Carbohydrates	0.3717	168.8	692	47
			1,460	100

* Seventy per cent. of this was in animal protein.

The food was of the best quality, and included 193 separate varieties. The cost per meal was 20 cents, or 13.8 cents per thousand calories. This is twice what the poor man in New York City pays for his food. But these growing athletic boys were not satisfied with the conventional 3,000 calories per day. The investigator of their dietary ascertained that beside the 4,350 calories which they consumed daily at the table, they bought 650 additional calories in food at a neighboring store, the principal item being chocolate.

Lusk[1] has called attention to the fact that the 5,000 calories thus contained in the daily diet of active American boys of school age are half again as much as a farmer at work is believed to require. This salient statistical discovery, based on a liberal series of observations rather than on a few scattered data, deserves emphasis to medical men, who are often called on to advise in matters of diet during childhood and adolescence. The total fuel intake of the boarding school boys was three times that of the basal level of from 1,700 to 1,800 calories, which is the heat production of boys from 13 to 16 years of age when resting or asleep. Such findings explain the ravenous appetite of boys. Lack of appreciation of this factor, says Lusk, and lack of provision for it, are the probable causes of much of the undernutrition seen in children of school age.

A liberal and adequate dietary does not necessarily draw heavily on many sources of food. In the selections for the school referred to, twelve dietary items yielded 75 per cent. of the requisite fuel value, the remaining 25 per cent. being distributed among the 181 other varieties of food. It is surely not without significance that bread, butter, milk and sugar together furnished half of the food fuel. They form an exceptionally wholesome combination.

1. Lusk, Graham: Food Economics, Jour. Washington Acad. Sc., 1916, vi, 390.
2. One metric ton equals 2,200 pounds.

PUBLIC DECENCY AND PUBLIC HEALTH

Hygienists are beginning to recognize that some of the public expenditures which are the outcome of modern demands for improved sanitation are not always directly justifiable on the plea of a menace to public health. Municipal baths, for example, embody elements of comfort and personal luxury as well as factors which contribute indirectly to health. Certain aspects of the complex problems of garbage collection, such as the transportation of decaying organic matter through public thoroughfares, are often objected to on the plea of danger to the health of the community, whereas it is usually the senses of sight and smell that are offended rather than the general physical well-being of the persons concerned.

It is important, where so many demands are continually being made on the public purse as well as on philanthropic resources, to analyze public needs thoroughly and locate them exactly. In the long run it does not pay to secure alleged benefits on a specious pretext. For this reason it is a sign of progress to see that some of the demands which a hasty consideration might ask health authorities to satisfy are henceforth to be charged to the needs of public decency. The distinction has been clearly exposed by the director of the Department of Social Welfare of the New York Association for Improving the Condition of the Poor.[1] He has pointed out that many communities provide the means for the cleansing of human bodies. It is just as essential to health and decency that public facilities, where private ones are lacking, should be provided for the cleanliness of the garments, the condition of which must otherwise lower the tone of decency of the people of the community. Decency is emphasized by Armstrong, because it is essential that health workers should realize more and more that it is impossible to justify most of our expenditures in certain directions, if we consider these expenditures to be inducive to health alone. It is difficult, he reminds us, to ascribe ill health to dirty streets, unsightly back yards, and such undesirable elements in our physical environment for the elimination of which we spend thousands yearly, not in reality to maintain public health, but, as a matter of fact, to establish public decency.

Among the mass of the poorly housed tenement population of the large American cities, the facilities for washing and drying clothes are decidedly meager. A statistical inquiry among families representing more than 200,000 people on the east and west sides of New York City showed that the percentage of families without equipment was as follows: without bath, 92 per cent.; without wash tubs in the home, 40 per cent.; without hot water, 87 per cent. In this country there are as yet few places in which people who have very inadequate home facilities may go and wash their

1. Armstrong, D. B.: The Municipal Laundry Problem, Jour. Home Economics, 1916, viii, 422.

clothes under decent and sanitary conditions for a small cost and with a minimum of time expenditure. Public laundries or wash houses have long been in use in foreign cities. With thirty-five such institutions in the city of London alone, patronized by nearly a million washers, may be contrasted eighteen in the entire United States, of which five are in Baltimore.

Experiments now under way by the New York Association for Improving the Condition of the Poor indicate that mechanically equipped wet wash laundries, even when run under quasipublic auspices, are likely to prove successful and fill a need in the community. The necessary capital investment is by no means prohibitive of further investigation in this direction. Public and private health and decency demand some provision of this sort in many places, even if the scheme adopted is only palliative and the plan not final.

Dr. Armstrong maintains that suitable municipal washing facilities have an educational value in addition to the purely utilitarian advantages. He summarizes his argument as follows: The public wash house, like the public bath, finds its chief justification in the fact that it gives to people an opportunity to learn how to be clean, and makes it possible for them to appreciate the value to health and decency of being physically clean. Physical cleanliness enhances our moral and spiritual tone. The people will recognize more acutely their housing and municipal defects, and will demand even more energetically than at present that equipment for clean bodies and clean clothes, whether within or outside the home, which they will have learned to use and value, and the importance of which, for the preservation of health and the maintenance of decency, they will have been educated to appreciate.

INTRATRACHEAL INJECTION IN THERAPY

"A common cause of disappointment," the "Pharmacology of Useful Drugs," states, "is the want of exact knowledge concerning the absorption of drugs. It is often asserted, and accepted without question, that because a given substance is very soluble in water, it must necessarily be absorbed readily from the alimentary canal. Disregarding the relatively slow absorption of soluble purgative salts, we may call attention to the fact that for some unknown reason, some of the very soluble glucosids are absorbed slowly and irregularly from the gastro-intestinal tract; also that certain glucosids or resins which are wholly insoluble in water are absorbed fairly rapidly from the gastro-intestinal tract. In other words, we must recognize the fact that every drug is a law unto itself in regard to its rates of absorption and elimination." In recent years drug therapy has aimed to make more certain the dosage of active substances and their efficient and prompt introduction into the region in which it is desired to have their potency manifest itself. For this reason subcutaneous, and latterly intravenous and intramuscular medication have supplanted oral administration of many drugs. Absorption is usually better assured, and speedy responses are more likely to follow.

The respiratory tract has been widely employed as a path of introduction for volatile substances, of which illustrations are afforded by the general anesthetics chloroform and ether. Less volatile substances are sometimes inhaled into the lungs for their local action, and even nonvolatile substances may be thrown into the respiratory passages suspended in a spray of vapor. Whether in the latter case the products actually penetrate into the alveoli has been seriously questioned. In any event, aside from the use of volatile anesthetics, the production of general in contrast with local effects has rarely been attempted through the channel of the respiratory tract.

Recent researches by Auer and Gates[1] have shown that intratracheal injections of potent drugs may be followed by prompt absorption even under disadvantageous conditions, so that the method may prove to be of value therapeutically. Experimenting on animals at the Rockefeller Institute for Medical Research, they have found that a simple intratracheal injection of a solution of epinephrin penetrates in a few seconds to the alveoli, chiefly those of the left lower lobe; that absorption is rapid and well maintained, and that the procedure may be repeated effectively a number of times even with a substance, like epinephrin, which decreases absorption.

The rapidity with which an intratracheal injection of epinephrin may promote a rise of blood pressure indicates that the absorption of the drug presumably occurs through the capillaries leading to the pulmonary veins. It has been demonstrated experimentally that absorption from the lung could be obtained at a time when double the dose of epinephrin given intramuscularly exerted no pressor effect whatever. Even after the development of pulmonary edema with the resultant diminution of the absorptive field, the drug was still taken up quite effectively.

The intratracheal incorporation of drugs requires a technic which is inconvenient in comparison with the usual clinical procedures. The desirability of its application to human subjects remains to be considered, since as far as is known no data are yet available. Auer and Gates maintain that the procedure ought to be simple. Tracheotomy ought not to be necessary. They suggest that a free hypodermic needle could be inserted into the tracheal lumen immediately below the cricoid cartilage and connected with a short length of rubber tubing with a syringe. To insure its reaching the alveoli promptly, the amount of solution should not be too small; probably from 3 to 5 c.c.

1. Auer, J., and Gates, F. L.: The Absorption of Adrenalin after Intratracheal Injection, Jour. Exper. Med., 1916, xxiii, 757.

would suffice. The puncture of the isthmus of the thyroid is not considered as significant under circumstances in which grave conditions, such as are encountered in impending cardiac failure, demand prompt attention even at some incidental risk.

It may be asked what advantage such a plan is likely to offer over current heroic measures in human therapy. In the first place the intratracheal method could probably be carried out with greater ease than the intravenous injection, particularly in such cases as cardiac weakness, in which the surface veins cannot always be entered promptly and with certainty. Moreover, Auer and Gates suggest that it is legitimate to expect some absorption from the lung alveoli as long as the heart-lung circulation persists, no matter how feebly. Thus the drug presumably will reach the heart to act on its failing structure more promptly than through introduction by the route of surface veins. A serious consideration of the plan in its application to clinical medicine seems justfied by the preliminary investigations.

Current Comment

THE COMPARATIVE PHYSIOLOGY OF UREA FORMATION

Comparative physiology — the contrast of the way in which related functions are performed in different types of organisms — has now and then thrown light on the obscurities of human physiology and pathology. Sometimes it has pointed to fallacious ideas in our conceptions of the working of the bodily mechanism. An illustration of the confusion which has arisen from the apparently conflicting data of comparative physiology is found in the study of the end-products of protein metabolism in different species. Whereas, in the case of the higher vertebrates, urea has long been recognized as the preeminent final stage in the disintegration of nitrogenous substances ingested, in birds and reptiles its place is taken by uric acid, a compound of far more complex chemical structure. Is urea a stage in the production of this uric acid, that is, is it an intermediary product of protein metabolism in uric acid-excreting species? When the amino acid digestion products of proteins are introduced into the organism of mammals, urea production manifests itself. Urea itself, introduced into the circulation of such animals, is rapidly distributed approximately equally in all the tissues except the fatty tissue, kidneys and urinary tract. The latter have a higher content, owing to saturation with urea in the process of excretion from the body. The fat, with its low content of water, can absorb much less urea than other tissues. In contrast with this, Karr and Lewis[1] of the University of Illinois have found that the urea content of the hen, a species excreting uric acid in place of urea, is low. The content of the kidneys is uniform with that in other tissues, in conformity with the fact that urea is not an end-product of prime importance in the nitrogenous metabolism of this animal. This is further substantiated by the results of injections of a typical amino acid, alanin. This likewise leads to no increment in the urea content of the blood or tissues. The analogies with the organism of man and the other higher vertebrates thus fail.

1. Karr, W. G., and Lewis, H. B.: A Comparative Study of the Distribution of Urea in the Blood and Tissues of Certain Vertebrates, with Especial Reference to the Hen, Jour. Am. Chem. Soc., 1916, xxxviii, 1615.

THE NATURE OF BENCE-JONES PROTEIN

The excretion of a protein of somewhat unusual properties in the urine, as it has long been described under the caption of Bence-Jones proteinuria, can no longer be regarded as an extreme rarity in clinical medicine.[1] Nevertheless, as the albuminous substance eliminated in this interesting and still unexplained anomaly differs notably from more familiar proteins of either urine or blood, and since it was first described by Bence-Jones as an "albumose," some confusion, not to say uncertainty, regarding its identity and characteristic properties still exists. The unusual behavior of the Bence-Jones protein in the urine toward heat — a diagnostic phenomenon which serves to call attention to the anomaly — has contributed to raise the pertinent question whether or not it is a disintegration product of some normal tissue protein, representing (as do the true proteoses) some abnormal breaking down of body structure or pathologic alteration of circulating proteins by some unusual enzyme. A recent investigation at the University of Pennsylvania[2] of the typical protein obtained from a patient excreting from 23 to 30 gm. of Bence-Jones protein per day indicates that the protein is capable of causing anaphylaxis. Introduced in large quantities into the circulation of animals it failed to give the slightest indication of toxic action. The normal clotting of the blood spoke strongly against the presence of proteoses which would have been in sufficient concentration to interfere with coagulation. This is quite in accord with the anaphylactic activity already described. Such indications now confirm the belief that we are dealing with a higher protein of individual biologic stamp and not with a degradation stage in the hydrolysis of any body protein. Taylor and Miller have found that this protein in the circulation of the patient is, like the plasma proteins, protected from digestion; but the isolated substance, evidently undenatured, is readily attacked by either pepsin or trypsin. This leads them to the comment that if the Bence-Jones protein is to be regarded as foreign to the tissues of the subject, we should by the Abderhalden hypothesis expect that a special ferment would soon be aroused to destroy it in the body; and certainly there would seem to be nothing in the nature of the substance itself to resist such a fate. Yet instead of being digested, large quantities of it are excreted in its native condition, apparently free from any hydrolysis; and this can continue indefi-

1. The Origin of Bence-Jones Protein in the Urine, editorial, THE JOURNAL A. M. A., Oct. 24, 1914, p. 1481; A Crystallizable Urine Protein, Current Comment, Feb. 20, 1915, p. 669.
2. Taylor, A. E., and Miller, C. W.: Studies in Bence-Jones Proteinuria, Jour. Biol. Chem., 1916, xxv, 281.

nitely. Under such circumstances, the Philadelphia biochemists conclude, we must dismiss the idea of a protective ferment. From every point of view it is clear that this substance in their case as in others is a higher protein, a human product closely related to the normal blood proteins.

THE CIRCLE NARROWS

Some of the leading advertisers in America have formed an "Association of National Advertisers." These advertisers are spending enormous sums every year in bringing their products before the public through the instrumentality of printers' ink. Should the public lose faith in their printed word, the members of this organization would find their business seriously crippled. Being reputable concerns and having meritorious products, honestly and truthfully advertised, these advertisers desire that advertising shall stand for a hundred-cents-to-the-dollar in the eyes of the public. When the Association of National Advertisers met last spring it adopted a declaration of principles. It went on record as being opposed to advertising of the following kinds:

All advertising that is "fraudulent or questionable."
All advertising that is "indecent, vulgar or suggestive."
All advertising that is "ambiguous in wording and calculated to mislead."
All advertising that makes "false, unwarranted or exaggerated claims."
All advertising to laymen of "products containing habit-forming or dangerous drugs."
All advertising that makes "remedial, relief or curative claims either directly or by inference that are not justified by the facts or common experience."
All advertising that may "cause injury in health or loss of confidence in reputable advertising and honorable business."

One might almost be excused for thinking that the Association of National Advertisers had the "patent medicine" business specifically in mind when it drew up its declaration of principles. Certain it is that practically all "patent medicine" advertising must be declared guilty on one or all counts in the Association's indictment. It is impossible to escape the belief that the Association of National Advertisers hasn't much use for the nostrum fraternity. But the Association did not stop with the mere declaration of principles. It backed up its words by declaring that its members, so far as they were able, would "direct their advertising to those mediums which made the observance of these principles their rule and practice." No wonder the "patent medicine" interests are loudly proclaiming their willingness to be good. "The devil was sick, the devil a monk would be; the devil was well, the devil a monk was he!" At present the nostrum industry is far from healthy.

Teaching Massage to Blinded Soldiers.—An exchange states that two schools have been organized in France for this purpose. One is in charge of Dr. Guilbert, who has long been blind himself. A good knowledge of anatomy is a prerequisite, and a set of relief charts have been made by eminent sculptors to aid in teaching anatomy to the blind. The men work alternately as masseurs and as subjects. Our exchange remarks further that the use of the metal casques has materially reduced the proportion of cases of injury of the eyes.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

DISTRICT OF COLUMBIA

Poliomyelitis in the District.—During the week ended September 2, three new cases of poliomyelitis were reported, one of which was apparently the result of infection in New Jersey. There were no deaths. The total number of cases reported since July 1 is twenty-six, of which eight represent imported infection. The deaths to date number four.

Poliomyelitis Regulations too Drastic.—The health officer of the District recommended to the commissioners of the District the promulgation of certain regulations for the prevention of poliomyelitis which were based on the minimum requirements laid down by the recent conference of state and territorial health authorities, as noted in THE JOURNAL, August 26. They did not, however, recognize the noninfectivity of persons over 16 years of age to the same extent as does the text of the standard minimum requirements, and they placed on persons bringing into the District from infected areas children under 16 years of age the duty of giving the health officer notice of the arrival of such children.

The health officer's recommendation for the promulgation of these regulations was based solely on the fact that they represented the consensus of opinion of the Conference of State and Territorial Health Officers with the United States Public Health Service and had the endorsement of representative bodies of local physicians. The health officer withheld his personal approval of the regulations which he submitted, pointing out that their very severity would tend to prevent reporting, at least in doubtful cases; that the limit placed on the supposed duration of infectivity, six weeks, was without sufficient basis in experiment or clinical observation; that any recognition of a lesser infectivity among persons over 16 years of age than among those of the younger group was without adequate foundation; that neither clinical observation nor efforts experimentally to convey poliomyelitis by natural means from monkey to monkey justified the popular conception of the disease as one that was easily spread by personal contact or that could be effectively checked by any efforts made to isolate persons exposed to the patient, and that the rigorous regulations adopted in New York, Newark, N. J., and Philadelphia had seemed to have no effect in checking the spread of the disease. The regulations as submitted by the health officer were submitted by the commissioners to the corporation counsel for consideration and have just been returned by him with the statement that because of their severity they would probably not be sustained by the courts unless a grave public emergency existed, and that evidence now available did not show any such emergency.

ILLINOIS

State Charities Meeting.—The twenty-first annual state conference of Charities and Correction will be held in Alton, October 20 to 22. In connection with this conference the Illinois Association for the Prevention of Tuberculosis, the State Association of County Home Superintendents and the State Association of Probation Officers will hold meetings.

Addition to Sanatorium.—A ten-foot sleeping porch is being erected which is to stand entirely around the new Rock Island Sanatorium. Ten new tents have also been ordered by the new hospital commission. Mrs. Carolin W. Juhl has been appointed head nurse of the hospital.——Drs. Joseph De Silva and Louis Ostrom, Jr., have been appointed on the building and grounds committee and Drs. Bernard J. Lachner and Cyrus T. Foster on the supplies committee of the sanatorium commission.

State Board Rules Regarding Poliomyelitis.—Owing to the prevalence of infantile paralysis, the state board of health, August 29, laid down special rules for two sections of the state. The first of the restricted areas takes in Macon and Piatt counties, Dora, Lovington and Lowe township in Moultrie County, and Tunbridge, Texas, Creek and Nixon townships in De Witt County. The other comprises all of LaSalle County, Clarion, Westfield and Hall townships in Bureau County, and Evans and Bennington townships in

Marshall County. Postponement of the opening of schools is ordered in these localities, and it is provided that no child under 16 years of age shall travel within or out of the restricted area unless in possession of a health certificate.

Chicago

Bardeen Lectures at Graduate School.—August 31, Dr. Charles R. Bardeen, professor of anatomy and dean of the Medical School of the University of Wisconsin, Madison, delivered an address before the Graduate School of Medical Sciences of the University of Illinois on "Study of the Anatomy of the Heart in the Living by the Use of the Roentgen Ray."

Department of Health Items.—August 25, the health commissioner requested the harbor master to intern five boats for violation of the ordinance which provides that boats shall not discharge sewage within 8 miles of the shore. The corporation counsel issued an opinion that the city had no power to intern offensive vessels. The health commissioner thereupon initiated legal proceedings to enforce the ordinance against lake pollution.

Health Certificates for Schoolchildren.—The board of education, on recommendation of the commissioner of health, requires this year that all pupils admitted to the public schools on their opening be required to present a health certificate to be furnished by a licensed physician showing that the pupil has no contagious or infectious disease; that there has been no contagious or infectious disease in the home or place of abode of the pupil, and that the pupil has not been exposed to any such disease within two weeks from the date of application for admission to the school.

MARYLAND

Standard Entrance Examinations.—Standard entrance examinations for professional study, which are held yearly, will take place September 18 to 23 at Baltimore. Credits earned in these examinations are intended primarily for students of medicine. They afford also an opportunity for men who have not been able to pursue a high school course to secure a standing equivalent to a high school diploma, which will be of service to him in other professions. These examinations are given under the authority of the Board of Medical Examiners of Maryland by their entrance examiner, assisted by a corps of specialists in different subjects. Full recognition is accorded these examinations by the New York State Education Department, placing them on an equality with their own examinations.

The Infantile Paralysis Situation.—The board of estimates of Baltimore has authorized the city health department to enter into a contract with the Children's Hospital School for the treatment of infantile paralysis cases, as the Harriet Lane Home at Johns Hopkins Hospital, and Sydenham Hospital, the city hospital for contagious diseases, can take no more cases of this character. The hospital directors have offered the city thirty beds for $800 a month, the city to contract to pay for the beds for three months. In addition, the city is to pay $1 a day for each patient over 30, to reimburse the hospital for any property that has to be destroyed, and to bear the expense of fumigating the hospital when the city's occupancy expires. The city must also pay for the removal of all the present patients to the Union Protestant Infirmary and for their care at that hospital.——Dr. Gilbert W. Rosenthal, of the Harriet Lane Home, Johns Hopkins Hospital, an expert on diseases of children, has been selected by Health Commissioner Blake as assistant resident physician at the Child's Hospital School, to take charge of the children suffering from infantile paralysis. Drs. William S. Baer and George E. Bennett will continue as visiting physicians in charge of the institution. Other physicians now there and the regular staff of nurses will remain. Dr. John F. Hogan, superintendent of Sydenham Hospital, and Dr. William T. Howard, Jr., assistant commissioner of health, will visit the hospital at frequent intervals.——In order to prevent the spread of the disease, thirteen physicians have been appointed to assist in the fight against the disease by watching railroad stations and steamboat wharves for arrivals from Philadelphia, New York and New Jersey, and all children under 16 years thus arriving will be kept under surveillance for fourteen days or longer. Arrangements are being made to have all automobile roads throughout Maryland watched in like manner.

The United States Public Health Service does not regard the situation in Baltimore as sufficiently serious to require its official assistance. Asst. Surg.-Gen. William Colby Rucker has consented to detail a physician to assist the city and state authorities in establishing its quarantine.

MICHIGAN

Fees for Contagious Disease Reports.—Checks varying in amount from 10 cents to $14 and totaling $195.30 have been sent, by the secretary of the board of health of Grand Rapids, to physicians of the city for reports of cases of contagious disease made to the health department.

Personal.—Dr. Philip G. Sanderson, Detroit, is a candidate for coroner of Wayne County on the Republican ticket.——Dr. Frank P. Bohn, Newberry, is a candidate for the Republican nomination for lieutenant-governor.——Dr. John A. Sperry, Lansing, has returned after a service of several months with the American Red Cross in the war zone and is visiting in Jacksonville, Fla.

Upper Peninsula Physicians Meet.—At the annual meeting of the Upper Peninsula Medical Society, held in Houghton, August 16, Escanaba was selected as the next place of meeting and the following officers were elected: president, Dr. Robert Bennie, Sault Ste. Marie, and vice presidents, Drs. Robert A. Walker, Menominee, and John MacRae, Calumet. The secretary-treasurer will be chosen by the Delta County Medical Society.

State Society Meeting.—The Michigan State Medical Society held its fifty-first annual meeting at Houghton, August 15 to 17, under the presidency of Dr. Alfred W. Hornbogen, Marquette. The following officers were elected: president, Dr. Andrew Porter Biddle, Detroit; vice presidents, Drs. James G. Turner, Houghton; John J. Mersen, Holland; Arthur O. Hart, St. Johns, and George S. Ney, Port Huron; delegates to the American Medical Association, Drs. Jacob D. Brook, Grandville, and Guy L. Connor, Detroit, and alternates, Drs. Carl F. Moll, Kenton, and Charles F. Kuhn, Detroit. The society adopted resolutions advocating universal military training and the passage of a law compelling all persons about to be married in the state to undergo physical examination, and providing drastic punishment for those who contract or assist in marriages in violation of the law. The subject of the presidential address was "A Review of Medicine and Surgery, with Especial Reference to the European War."

NEW YORK

Hospital for Infantile Paralysis.—At a recent meeting of the Hempstead Town Board of Health, Health Officer Dr. Howard M. Phipps was authorized to inspect and report on the suitability of the hospital connected with the town almshouse at East Hempstead for the reception of infantile paralysis patients.

Inoculation of Milk Peddlers.—At the meeting of the common council of Rochester, August 22, R. A. Hamilton, commissioner of public safety, on the recommendation of Health Officer Dr. George W. Goler requested the council to pass an ordinance requiring all persons peddling milk in the city to be inoculated against typhoid fever. The communication was referred to the law and public safety committees.

Special Course in Public Health.—Eighteen health officers have already been enrolled to take a special course of study approved by the Public Health Council. After a reading course of one month, a course of lectures and quizzes began, September 8, at the Medical College of Syracuse University. This course will continue until November 25, when an examination will be held, after which certificates will be issued to the successful candidates. Another course will be given in the winter.

Personal.—Dr. LeRoy B. Vail, Flushing, is reported to be ill with anterior poliomyelitis and is said to be doing well.——Dr. Robert Lount, health officer of Hempstead, suffered a cerebral hemorrhage, August 26, and is reported to be in serious condition.——Dr. Edward E. Hummel, Darien Center, coroner of Genesee County since 1901, announces that he will not be a candidate for reelection. Dr. William J. Ryan, Oakfield, has announced his intention to be a candidate for the office.

Infantile Paralysis in the State.—There were forty cases of infantile paralysis reported to the state health department, September 1, with three deaths. The total number for the state thus far, exclusive of New York City, is 2,086, and the deaths, 227. The August *Bulletin* of the state department of health states that there were 336 cases reported during the month of July, up to the 29th. These cases were located in

130 municipalities, but for the most part in the counties adjoining New York City and along the Hudson River. There are sixty-nine cases in patients who came from New York City a few days previous to the onset. An analysis of 121 cases in which special data has been received shows that sixty-nine patients were males and fifty-two females. About one half of the children were of American parentage. Data respecting the sanitary conditions of the homes indicate that conditions were bad in thirty-five instances; fair in thirty; good in thirty, and excellent in twenty-four.

New York City

Money for City Hospitals.—Commissioner Kingsbury of the City Charities Department has announced the completion of the plans for new buildings and remodeling old buildings at the Seaview Hospital for Tuberculosis Patients on Staten Island and the Children's Hospital and schools for mentally defective children on Randall's Island. For these purposes $1,400,000 has been appropriated by the board of estimates. The new plans will double the capacity of the Seaview Hospital, so that it will accommodate 2,000 patients, and will consist of twenty-one open cottages, each containing forty-eight beds. There will also be a group building for men, with a dispensary, large dining hall, industrial rooms, billiard and recreations rooms and a general lounging room.

Mosquito Extermination Effective.—It is reported that recently the health commissioner took a party of 100 newspaper men and civic workers over the marsh lands adjoining Jamaica Bay for the purpose of refuting certain newspaper stories that mosquitoes thrive and multiply under present methods of extermination. The work that is being conducted was explained and it was made evident that the new crop of mosquitoes will be a failure. The city appropriated $150,000 for this drainage work, $60,000 of which is to be expended along Jamaica Bay and the remainder along Flushing Bay. Many Long Island towns have taken up the work of extermination. Since the work on mosquitoes was begun in 1907, 23,000 acres of marsh have been drained, for which the city has paid $164,893. It is stated that when the work of the present season is completed the quantity of undrained marsh land in the vicinity of New York will be negligible.

Infantile Paralysis.—Up to September 2 there had been reported 8,148 cases of infantile paralysis in Greater New York, with 1,968 deaths. September 1 there were sixty-eight new cases with seventeen deaths, and this number was slightly higher than for the preceding days of the week. For the week ending July 8 there were 557 cases, while for the first six days of the current week there were 416 cases. In the meantime the number of cases reported for one week mounted as high as 1,210 cases for the week ending August 12. This would indicate that the epidemic is very definitely on the decline. As a result quarantine regulations for those going out of the city have been somewhat relaxed.——Special attention is now being directed to the aftercare of the victims of infantile paralysis. With the termination of quarantine at home or with the discharge of a patient from the hospital, the following printed notification is given to the parents:

> Your child is about to be discharged from the immediate care of the department of health, there being no longer any danger of his (or her) spreading the disease. While in the hospital, much has been done to lessen the deformities. There remain, however, weakness of.....
> .....
> With proper care, this deformity will be greatly lessened. With neglect, it will tend to increase. You are strongly advised to consult your family physician, if he is skilled in the care of deformities, or visit the nearest one of the orthopedic dispensaries in the city given on the enclosed list. *In any case, place your child under proper supervision for at least a year, as this tends to lessen permanent disability; neglect may increase deformity.*

The brace fund of $25,000, asked for by the health commissioner, now totals about $23,000. Among the contributions of the last few days have been two checks of $1,000 from Edward S. Harkness and Mrs. Stephen V. Harkness.

NORTH CAROLINA

Inspection of Hotels.—The inspection of hotels in the state by the state board of health began August 7. The inspectors assigned to this duty were Drs. Watson S. Rankin, George M. Cooper and James R. Gordon, all of Raleigh.

Intensive Health Work.—Dr. E. B. Washburne, late director of the International Health Commission on duty at Trinidad, British West Indies, will, September 1, inaugurate and personally conduct for the ensuing year a scientific study of intensive health work in Wilson County, under the joint direction of the International Health Commission and the North Carolina State Board of Health.

Antituberculosis Campaign.—Dr. James E. Malone, Louisburg, health officer of Franklin County, has just closed a three months' antituberculosis campaign, lecturing to the people throughout the county, diagnosing cases and suggesting care and treatment as occasion offered.

PENNSYLVANIA

Philadelphia

Personals.—Dr. Daniel J. McCarthy, who has been in Europe as a representative of the United States government investigating prison camps, returned home, September 1.—— Dr. Dudley J. Morton, who for four months has been connected with the American Ambulance Hospital in Paris, returned home, September 2.

Infantile Paralysis.—No sign of abatement in the epidemic of infantile paralysis has been shown during the past week. New cases have been reported every day excepting Thursday, and the largest number recorded excepting on one previous day was twenty-five. Human serum is being used in the treatment of the disease at the Municipal Hospital, but no results have been given out. The serum on hand in the Municipal Hospital has been practically exhausted and appeals have been made for persons who have recovered from the disease to supply blood to the health department. Twenty-five persons have thus far responded to this appeal. During the last two days blood was taken from five immunes at the Orthopedic Hospital and on September 1, several immunes from a Philadelphia institution gave their blood while at a shore resort. As stated before no definite report as to the value of the serum has been issued but the authorities are encouraged by the influence they have observed in the use of the immune serum. The public schools throughout the city will not be opened before October 2, excepting the Girls' Normal School and the School of Pedagogy. September 1, sixty-five additional men were added to the quarantine guard, and this has increased the number to 300. One hundred and twenty-five more are to be added to the roll, September 5. Since July 1, 850 cases of the disease have been reported to the state health department and 499 of these have occurred in the city of Philadelphia. The total number of deaths since July 1 was 214. Seventeen new cases were reported from different sections of the state on September 1.

CANADA

Personal.—Dr. Edward Ryan, who went to England with the Ontario Government Hospital, last April, and who has had charge of the psychopathic ward in that institution at Orpington, Kent, is returning to Kingston, Ont., on two months' furlough. The department with which he was connected has so little to do that it looks after surgical cases. ——Maj. Lewis E. W. Irving, D. S. O., Toronto, is now in command of the Canadian Division at the Woodcote Park Convalescent Hospital, near Epsom.——Capt. John Arthur Cullum, C. A. M. C., Regina, Sask., medical officer of the Twenty-Eighth Battalion, Canada, has been awarded the military cross.

University News.—The Faculty of Medicine of the University of Toronto, which suffered from the enlisting of professors and students sixteen months ago for overseas service in connection with the University Base Hospital, will be strengthened by the return of Dr. John J. MacKenzie, professor of pathology and bacteriology, and Dr. Benjamin P. Watson, professor of obstetrics and gynecology. Lieut.-Col. Alexander Primrose, Toronto, who returned from Saloniki some weeks ago, will also remain, as his services are required both at the university and the Toronto General Hospital.

GENERAL

Bequests and Donations.—The following bequests and donations have recently been announced:

Home of the Good Shepherd, Peoria, and St. Joseph's Home for the Aged, Peoria, each $5,000; St. Francis Hospital, Peoria, $2,000, by the will of Archbishop Spaulding.

For the construction of a children's building in connection with the Fayette County Tuberculosis Sanatorium, a donation of $10,000, by Miss Magdalen McDowell, Lexington, Ky., in memory of Dr. William Adair McDowell.

Confederation of County Societies to Meet.—The newly organized Confederation of County Medical Societies of Northern Illinois and Southern Wisconsin associated with Eastern Iowa announces that its first annual convention will

be held at Freeport, Ill., September 26 and 27. Clinics are to be held in the Freeport hospitals on the mornings of both days and in the afternoons and evenings scientific papers will be read and discussions held.

Child Labor Bill Becomes a Law.—The National Child Labor Bill became a law, September 1, when it was signed by the president. It aims to limit child labor within the states by prohibiting the transportation in interstate or foreign commerce of any product of any mine, quarry, cannery, mill, workshop, factory, or manufacturing establishment in which child labor is employed. A synopsis of the bill appeared in THE JOURNAL, August 19.

Infantile Paralysis Conference.—At a meeting of health officials of Rhode Island, Maine, New Hampshire and Massachusetts at the State House, Boston, August 23, a form of identification certificate in connection with infantile paralysis was decided on, and it was agreed that, for the convenience of travelers, the local boards of health should be instructed to issue certificates in due form, to persons who intend to go to states which require such certificates, provided a clean bill of health be obtained.

Mississippi Valley Physicians to Meet.—The forty-second annual meeting of the Mississippi Valley Medical Association will be held in Indianapolis, October 10, 11 and 12, with headquarters at the Claypool Hotel, under the presidency of Dr. Willard J. Stone, Toledo, Ohio. In addition to the usual papers of the meeting, there will be symposiums on fractures and on syphilis. There will also be a scientific exhibit which has been arranged by Dr. Frank B. Wynn, Indianapolis. Dr. Albert E. Sterne, Indianapolis, is chairman of the committee of arrangements.

Health of Indians.—Earnest efforts have been made to afford recently better hospital facilities for Indians, the number of such hospitals having been increased from 53 in 1912, with a capacity of 1,256, to 74 in 1915, with a capacity of 2,045. In view of the widespread prevalence of trachoma, and tuberculosis as reported by the investigation of the Public Health Service, ophthalmologists have been increased in number from 3 to 7, and the number of regular agency physicians increased from 89 to 130, and contract physicians from 53 to 76. The appropriation for relief of distress has been increased from $200,000 to $350,000, the amount covered by the present bill. Seven traveling dentists have been employed. A baby-saving campaign has also been instituted.

Tuberculosis Conferences.—The Mississippi Valley Conference on tuberculosis will be held at the Seelbach Hotel, Louisville, Ky., October 4 to 6, under the presidency of Walter D. Thurber, Chicago. The object of the conference is to bring about a closer relationship between antituberculosis agencies in the Mississippi Valley, to provide for the interchange of ideals and experiences, to strengthen and extend the work of the national association, to arouse the people of the Mississippi Valley to the needs of concerted action and to effect closer relations between the antituberculosis societies and other health agencies. Dr. Dunning S. Wilson, Louisville, Ky., is secretary-treasurer of the conference.—— The third Southern conference on tuberculosis will be held at Jackson, Miss., October 30 and 31. The states comprised in this conference are North Carolina, South Carolina, Tennessee, Georgia, Florida, Alabama, Mississippi and Louisiana.

Measures Against Malaria.—The International Health Board has taken up the consideration of the subject of malaria under the phases of geographic distribution and district of infection. Two sets of experiments to test the practicability of malaria control are being carried out; one, the detection of the carriers and freeing them of the parasites, and the other a combination of control measures. The first experiment is being carried out in Bolivar County, Miss., under the administration of the Mississippi Department of Health, with Dr. Walter S. Leathers, University, as administering director and Dr. Charles C. Bass, New Orleans, as scientific director. The field force and microscopists have received their technical training in the laboratory of Tulane University. The second series of experiments is being carried out in Arkansas in cooperation with the United States Public Health Service, under the charge of Surg. Rudolph H. von Ezdorf.

Tuberculosis Week.—The National Association for the Study and Prevention of Tuberculosis announces that tuberculosis week will be observed from Dec. 3 to 10, 1916. Especial attention is directed to three days in this week; namely, Medical Examination Day, December 6; Children's Crusade Day, December 8, and Tuberculosis Sunday, December 10. The National Medical Examination Day comprehends the securing of the interests of at least three distinct groups of individuals: physicians, employers of labor and working men. Physicians are urged to make examinations on this day without charge. Efforts will be made to interest medical societies and labor unions in the work of this day and advertisements inserted in the newspapers. The association also gives a list of the available literature for tuberculosis week, which includes a tuberculosis week circular, some talking points about tuberculosis, tuberculosis day prayer, talks for schoolchildren and circulars on the periodical medical examination and indifference to tuberculosis.

American Chemical Society Meeting.—The annual meeting of the American Chemical Society will be held in New York, September 25 to 30. One of the principal features of the occasion will be a symposium on occupational diseases presided over by Prof. Charles Baskerville, head of the Department of Chemistry of the College of the City of New York. This symposium will consider the chemical trades—prophylaxis in chemical industry diseases, incidental to work in anilin and other coal tar products, cedar lumber, mines and explosives. The opening address of the meeting will be delivered by Dr. Charles H. Herty, the president, on "The History of Chemistry and the Chemical Industries of This Country and Outlining Developments Since the Outbreak of War in Europe." On Wednesday and Thursday mornings there will be a general symposium on colloids, theoretical considerations being discussed on the first day and the industrial applications of colloid chemistry on the second morning.

Appropriations for Medical Department and Hospitals.—In the act passed by the present Congress, which makes appropriations for sundry civil expenses for the fiscal year ending June 30, 1917, the following sums are appropriated:

For furnishing artificial limbs and apparatus or commutation therefor, and necessary transportation, $65,000.

For furnishing surgical appliances to persons disabled in the military or naval services of the United States, and not entitled to artificial limbs or trusses for the same disabilities, $1,000.

For trusses for persons entitled thereto, $2,500.

For the support and medical treatment of medical and surgical patients who are destitute, in the city of Washington, under a contract to be made with the Providence Hospital by the Surgeon-General of the Army, $19,000, of which one half shall be paid from revenues of the District of Columbia.

For maintenance, to enable it to provide medical and surgical treatment to persons unable to pay therefor, under a contract to be made with the board of charities of the District of Columbia, $19,000, of which one half shall be paid from the revenues of the District of Columbia.

For necessary improvements, repairs and equipment for isolation building for minor contagious diseases, $5,500, of which one half shall be paid from the revenues of the District of Columbia.

Hospital of the National Home for Disabled Volunteer Soldiers, Dayton, Ohio., $72,000 for pay, services for care of the sick, burial of the dead, supplies and repairs.

Hospital of Northwestern Branch, Milwaukee, $45,000 for same purposes.

Hospital of Eastern Branch, Togus, Me., $38,000 for same purposes.

Hospital of Southern Branch, Hampton, Va., $43,000 for same purposes.

Hospital of Western Branch, Leavenworth, Kan., $52,000 for same purposes.

Hospital of Pacific Branch, Santa Monica, Calif., $53,000 for same purposes.

Hospital of Marion (Ind.) Branch, $40,000 for same purposes.

Hospital of Danville (Ill.) Branch, $42,000 for same purposes.

Hospital of Mountain Branch, Johnson City, Tenn., $35,000 for same purposes.

Hospital of Battle Mountain Sanitarium, Hot Springs, S. D., $35,000 for same purposes.

For the publication of bulletins prepared under the direction of the Surgeon-General of the Army for the instruction of medical officers, $3,000, or as much thereof as may be necessary.

For sanitation, quarantine, hospitals and medical aid of the insane and of lepers, and aid and support of indigent persons legally within the Canal Zone, including expenses of their deportation when practicable, $700,000.

FOREIGN

Letter from Berlin.—V. Scheel is editor of the *Ugeskrift for Læger* at Copenhagen and he recently went to Berlin with four other Danish civilian and military physicians to study the methods in vogue there for treating the wounded and mitigating the ills of all kinds which the war has brought. We give a literal translation of a letter from him in the *Ugeskrift* for August 3 as follows:

CHANGES IN THE CITY

"Those who visit Berlin these days find the city changed in several respects. The lack of rubber has limited the number of automobiles and bicycles on the streets to the minimum, and the decrepit nags in the cabs shows that the war has taken all the capable horses. The absence of the male population is noticeable by the extent to which women are serving in men's positions, as conductors, as motormen on the electric tramways, as letter carriers, street sweepers and even in heavy paving work.

THE FOOD SUPPLY

"Germany, especially the large cities and the regions where there is not much cultivated land, as in Saxony, is contending with important difficultics in regard to food (*kaemper jo ved betydelige Ernaeringsvanskeligheder*) which just now, immediately before the gathering of the new harvest, is greater than at any time previously. Everything for the present is scarce; potatoes, which had been counted on, were backward on account of the cold spring, and as a consequence there is a lack of potatoes; the bread ration is 200 gm. a day; meat only 200 gm. a week—Tuesday and Friday are meat-free days—butter ration is 90 gm. a week; cream is as good as never seen at all; eggs are very expensive, and it is being considered whether to reduce the ration to two eggs a week per individual; sugar is also scanty which is an inconvenience now that the new fruit is to be put up; the many 'substitute' preparations for foodstuffs are no improvement of the nourishment.

"The stranger sees this, but does not himself note any lack as the ration permitted can be made up with green vegetables, fruit and poultry for which no maximal amount has been established. It makes a peculiar impression, of course, when one, for instance, wants to buy a sandwich, to be obliged to establish his right to the sandwich by presenting coupons for butter and meat from his bread and meat cards. To what extent the populace is or is not suffering from the scarcity of provisions it is of course difficult for one on a brief visit to determine. One sees always in a large city many undernourished and pale persons, but apparently there are no more now than usual. The poor women and children waiting patiently by the hour in front of the stores where provisions are sold, so that they can be sure of what they are permitted to buy, speaks its own language; the right to the different articles of food is restricted to being on the spot.

ORGANIZATION

"In the meanwhile—Germany is the land of organization, and the state has taken hold with a firm hand to come to the aid of the populace. The children are fed in the school, and round about in Berlin public kitchens have been established where the people can go for their midday meal or eat it on the spot. The food is tolerably good; it is eatable, in any event. Nursing women, young infants and the sick can get extra rations on a physician's order, entitling them to cards to enable them to buy milk or more bread and meat, of course at moderate prices. The sick who require special diets can obtain them from the hospital kitchens. It is believed that by these arrangements the difficulties have been mastered, and it is certain also that, so far as one can see, it is possible in this way to feed the people, in any event so that Germany need not on this ground suffer loss. (*i alt Fald saaledes, at Tyskland ikke af den Grund behöver at give tabt.*)

"The question how far this scarcity of provisions has had an influence on the public health is difficult to answer, as it may well have suffered without this becoming appreciably apparent in the morbidity and mortality statistics. I had opportunity to examine the mortality curves of different diseases since the beginning of the war, at the office of Stadtmedizinalrat Weber. The figures show no increase in the mortality. Infant mortality has kept at the same level as before the war, and in absolute figures has declined, as there are fewer young infants. There has been no increase in the mortality from epidemic diseases except that tuberculosis has shown some increase in the last months.

EFFICIENT TREATMENT OF THE WOUNDED

"The treatment of the wounded and the solving of all the questions connected therewith, into the smallest details, was stamped on the whole of the Germans' preparedness and efficiency (*Tyskernes hele Forudseenhed og Dygtighed*). The hospitals for the wounded are so numerous at Berlin that the beds have never all been occupied at one time. Some are in new barracks, erected and well equipped for the purpose, others in schools and other buildings. The trains from the battlefields run to the doors of the barracks hospital. We saw one train that had arrived an hour before from the western seat of war, and it was empty. All the wounded had already been installed in their beds. At the beginning of the war the wounded were transported on litters which were suspended from springs to overcome the movements of the train. But it was found that the vibrations of the springs kept the men from resting while the litters were carried off with the wounded, and the train sometimes had none left. For these among other reasons, it was found better to have beds built into the car, with a spring bottom. They are arranged in a double row, one above the other, lengthwise of the car. The train had its kitchen, pharmacy and operating room, but as few operations as possible are done on the way. The chief of the lazaret is a military surgeon but he attends almost exclusively to the administration; the physicians in the different barracks work independently. Every effort is made to keep the convalescents interested; lessons are given in languages and in practical trades. All the barracks hospitals have grounds where the men raise chickens and rabbits, and there is much emulation between the men. The meals were good. In all the hospitals I visited, both civilian and military, I was impressed with the fact that any scarcity of provisions was not allowed to affect the diet of the sick. The hospital food everywhere was above reproach.

SPECIAL HOSPITALS

"Besides these general hospitals to which all the wounded and the sick are referred, there have been organized a series of specialist departments for special affections. Thus the College of Sculpture at Charlottenburg, which also has been taken for a hospital, is devoted mainly to lesions of the jaws. Some of them are horror-inspiring when they arrive, the lower part of the face and the greater part of the jaws shot away. It is wonderful to see how nearly human such faces can be made after a few months of treatment. The principle is to remove as little tissue as possible. Comminuted fractures may heal and new bone proliferate from scraps of periosteum. Only when it is seen to what extent Nature can be counted on in the repair, is aid afforded by transplantation of a piece from the tibia, fat tissue from the abdomen, skin from the arm, and thus gradually a new face is built up, and supplied when necessary with prostheses for all the teeth and palate. The whole is really worthy of the institution in which it is housed, an actual College for the Plastic Arts. Dentists as a rule are in charge and do the work, as it was assumed that it would be easier for a dentist to supplement his special skill by learning to do transplantations, etc., than for an ordinary surgeon to acquire skill in constructing, modeling and applying prostheses for the teeth and palate.

"Another special hospital I saw had been arranged on Prof. H. Strauss' initiative to treat gastro-intestinal affections and diabetes. The intestinal affections are to some extent the consequence of dysentery, which has been quite prevalent in the field, but the majority were cases of aggravation of preceding gastro-intestinal troubles, especially stomach troubles. Diabetics were few; only one case was known that had developed in the field. The importance of such special hospitals lies not only in the better facilities for dietetic measures, in comparison to the general hospitals, but also in the fact that the men's capacity for further service in the field can be estimated better here.

ARTIFICIAL LIMBS

"A question which has interested medical men particularly in this war has been that of artificial limbs and training in their use. The impression has been that there was a very large proportion of injuries of the arm entailing paresis, especially radial paralysis, or more or less crippling amputation. An exposition of artificial limbs was held which demonstrated the way in which the construction of these prostheses had attained simplicity and efficiency. In the Brandenburg lazaret we had opportunity to see them applied and in use. This lazaret was installed in an insane asylum which was complete at the outbreak of the war but had not been used. There was a farm connected with the institution, and those who had been farmers before their injury are being trained in the use of their prosthesis. The superintendent of the farm department is a man who lost his right arm in childhood and who many years has been a successful farmer with his prosthesis. It is clear that the example of such a man is most inspiring to the men with their new prostheses. We saw this man mow a field of rye and bind up the grain and do it as skillfully as any one could do with both hands. In addition to this department there are training schools for all kinds of work where the disabled maimed are trained.

A PRISONERS' CAMP

"In Brandenburg we had further opportunity to visit a prisoners' camp. It housed 10,000 prisoners but most of them were away at the time, working in the field or factories. Work is not compulsory, but most of the men are glad of the opportunity for something to do, and they prefer the food they get from the farmers to that in the prison camp. The prisoners in this camp were mainly Russian. They sleep on wooden beds in two tiers in large barracks. The camp is

separated into districts, each with quarters for 1,000 men. These districts are enclosed in a barbed wire fence, so that if epidemic disease breaks out in one district it can be isolated by merely stationing a guard at the single gate. The food supply is in the hands of the military authorities here as elsewhere; unpleasant experiences having shown the folly of farming it out to private parties. The food rations are calculated according to the calories—2,500 calories a day; this is a little scanty, but scarcely scantier than most of the Germans just at present are living on, and judging from the people's aspect the nourishment was sufficient. The quality of the food seems to be stamped somewhat with the scarcity of foodstuffs, but of course we cannot set up our palates as judges of taste here. Among the prisoners were some Russian physicians who treated the sick in a special barracks fitted up as a hospital, although with Spartan simplicity; they were not very happy in their monotonous existence and had but one wish: to be exchanged."

CONQUERING TYPHUS

In conclusion Scheel describes the way in which typhus has been conquered as one of the most interesting sections of the medical side of the war. He says: "Although it has always been endemic in Russia and yearly claims not a few victims, no one had ever had a clear idea as to how it was transmitted and how it could be combated. The French bacteriologist Nicolle suggested that it might be transmitted by the louse, but no serious attempts were made to confirm the soundness of this hypothesis or apply its consequences in practice. When the disease invaded Germany, important research on it was undertaken at once. The conclusion was soon drawn that body lice were probably responsible for the transmission, and organized efforts to 'unlouse' the men were at once undertaken. From the moment when it became possible to obtain the mastery over lice, the disease was rooted out of Germany; single cases may be imported as the incubation period is fourteen days, but when no lice are to be found the disease cannot spread. A typhus patient can sleep with other patients without infecting them. Every soldier is 'unloused,' before he is allowed to leave the front, and in every railroad station in Germany there stands a reservist soldier and he demands from every military person—generals as well as privates—who comes from the front, to produce his *Entlausungsschein*, his card certifying that he has been 'unloused', before he is allowed to leave the depot. In the prisoners' camp the unlousing was done with very simple means. The lice are killed with steam and dry heat applied in a wooden building lined throughout with roofing pasteboard. The steam is developed in a locomotive which is run close to the barracks. The men enter a room and deposit their watch and other valuables in a locker in the outer wall. The clothing is marked with a number and hung up on a hook and carried into the sterilizing room where it hangs in rows as in a wardrobe. A tube brings the steam from the locomotive. It enters with a force of twelve atmospheres, a wooden screen preventing the steam from blowing the clothing off the hooks. Maximal thermometers are suspended among the clothes and a thermometer and manometer are arranged so they can be read from outside. In the course of half an hour the temperature in the room is brought to 110 C., which is more than enough to kill lice. Leather goods are sterilized with dry heat in another room heated by the steam sent through pipes. In the meanwhile the men have passed into a room where the hair and beard are cut, the hair on the bodies being also shaved. They pass then into the room where there are large tubs and douches and the men are soaped and scrubbed. They then pass into another room, located on the other side of the sterilizing room, and their clothing is handed to them, well dried after the sterilization. They can then leave the establishment, getting their valuables by unlocking the lockers from outside the building. A thousand men can thus be 'unloused' in an hour's time. That not merely lice but all bacteria are killed at the same time is self-evident. The barracks themselves can also be disinfected by the steam from the locomotive at any time; formaldehyd disinfection does not kill lice.

MEDICAL RESEARCH

"The mode of transmission and prophylaxis of typhus are by no means the only subject for scientific research during the war. We had opportunity to see a collection of pathologic-anatomic preparations which have been collected mostly by Aschoff, and which are exhibited in the Kaiser-Wilhelms Akademie at Berlin. The future will not lack material to study the action of projectiles from modern weapons; there are also on exhibition lungs showing the lesions from asphyxiating gases. It is too early to draw up the balance sheet of the war; at the moment the evil predominates, but as many technical improvements which will prove of importance in the days of peace have resulted from the demand which the war has entailed, so will medicine in different fields experience new impulses and new life from the war, and indirectly it will thus have an important influence on the general progress of civilization."

LONDON LETTER

LONDON, July 19, 1916.

The War

THE ARMY MEDICAL SERVICE

Nearly half of the civilian physicians have now abandoned their ordinary work for military service, and yet the medical work of the country goes on apparently smoothly and efficiently, though with some difficulty. Various readjustments have, of course, been made. Physicians retired from practice but not too old for work have come back. Women physicians have been made use of in increasing numbers. Refugee Belgian physicians are employed in general practice and in institutions, and American physicians have been employed in the hospitals both at home and in France. The whole British medical profession, from the consultants to the general practitioners, readily responded to the call of their country, and many of the former, who were earning large incomes, are now wearing khaki for pay which hardly covers the rent and taxes on their houses. Public bodies and wealthy persons with large houses have freely given up buildings for the treatment of the wounded. The result is that military hospitals, large and small, have sprung up in every direction. In London at present there are no fewer than 186. Of these, thirty-nine, which are the largest, are army hospitals proper; the rest consist of private buildings and local institutions, all of course under the control of the war office. The immense number of wounded has enabled specialism to be organized on an unusual scale. Thus one hospital is devoted to injuries of the jaw. Conservative surgery is the order of the day; amputations are avoided as much as possible. At the Herbert Hospital, out of over 3,000 operations, only twenty-five have been primary amputations. Following the example set by our ally in the treatment of those crippled by wounds, at the Grand Palais in Paris, attention is being directed to physical therapy. Electricity, hydrotherapy, radiant heat, massage, passive exercises, mechano-therapy, progressive physical training are all being employed. For men who have lost a limb or other portion of the body there is a special hospital at Roehampton where the latest developments of prosthesis are placed at their service. There are actually both British and American firms on the spot engaged in the manufacture of artificial limbs. Another hospital is devoted to prosthesis for the ghastly disfigurements of the face which so often are produced by high explosives. The work is done under the supervision of a famous sculptor, Mr. Francis Derwent Wood. Metal masks are largely used, together with artificial eyes. The masks are of copper silvered over, made to correspond exactly with the injury, and then tinted a flesh color. The designer derives great assistance from a photograph of the injured man taken before he was wounded. In one case a man had lost an eye, in the place of which there was a deep cavity; his nose was gone and his upper lip disfigured. A mask was made to resemble the missing part as shown by an old photograph, an artificial eye was obtained that exactly resembled the other eye, and an artificial mustache was attached to the part of the mask that represented the upper lip. So successful was the result that at the distance of an ordinary sitting room the substitution was not perceptible. Only on close inspection could the dividing line between the skin and the mask be seen. The mask is fixed either by specially constructed spectacles or by spirit gum. The latter is somewhat irritating, and therefore is used only to fix small metal plates to conceal minor cavities.

SPHAGNUM MOSS AS A SURGICAL DRESSING

The immense demands of the war for surgical dressings have rendered gauze and cotton wool expensive and difficult to obtain and have directed attention to sphagnum moss, which grows abundantly in several parts of the country. It is inexpensive and makes a most satisfactory dressing. Sir Alexander Ogston, professor of surgery in the University of Aberdeen, who is an advocate of this dressing, estimates that in the next eight months of the war some thirty millions of

combatants will be exposed to the risk of accidents, disease and wounds. On the basis of the statistics of previous wars he concludes that 20 per cent. of the wounded will be killed and 80 per cent. require surgical attention, and that both categories will amount to from 12 to 15 per cent. of the men engaged. Applying these figures, he takes it that of the thirty millions engaged, fifteen will be in the firing line, and of the latter a minimum of 10 per cent. will be wounded and need surgical assistance. Considering the vast quantity of dressings required, he thinks that the common sphagnum moss will fulfil all requirements. It is soft and pliable, and grows in inexhaustible abundance. It was first employed in the Franco-Prussian War of 1870, but disappeared from use as other materials were easily obtainable. It can easily be sterilized or impregnated with a disinfectant.

Precautions Against the Spread of Infantile Paralysis

The severe epidemic of infantile paralysis in New York has attracted considerable attention in this country, and our health authorities are giving anxious consideration to the prevention of the spread of the disease to this country. The medical correspondent of the *Times* has suggested that quarantine regulations should be enforced on passengers from New York and other infected areas, and that thorough disinfection be carried out in all cases of the least doubt. The local government board, however, regards quarantine as obsolete and useless in the case of any acute infectious disease, and considers that attempts to enforce it in the case of poliomyelitis would be impracticable, if not actually mischievous. Every possible precaution is being taken to prevent the disease spreading to this country. The board receives notification every day of the sporadic cases which occur in this country. So far the numbers are not exceptional. During the present year the cases may be reckoned as isolated units in the country as a whole, but thirty-nine cases have occurred in the city of Aberdeen.

Bubonic Plague at Bristol

Three cases of bubonic plague have occurred at Bristol, but the patients are progressing favorably. As no fresh cases have been reported for eleven days, the position is regarded as favorable, the period of incubation being from five to seven days. Careful precautions have been taken for dealing with material liable to prove dangerous and for dealing with rats. One rat which was caught had the disease, and it seems probable that the three cases arose from it.

PARIS LETTER

Paris, Aug. 10, 1916.

The War

CARDIAC FATIGUE IN SOLDIERS

Although the more serious results of overtaxed heart are exceptional in the present phase of the war, it is by no means rare to find less grave cardiac troubles resulting from fatigue. Dr. Lian has made a report on this subject to the Réunion médicale de la IV-e Armée. This report deals with the conditions found in soldiers who complain of palpitation, dyspnea and precordial pain and oppression while on the march fully accoutered or during gymnastic running exercises or during digging. Unless they stop for a few moments every now and then in the course of hard work, they are apt to suffer from a sudden sensation of weakness with vertigo. The result of physical examination is almost or entirely negative when practiced on the patient lying down; but on change being made to a standing posture, there occurs an immediate acceleration of the pulse to 100 or 120 beats per minute. Under the effect of the slightest effort, the heart beat raises to 140, returning eventually to the original rate, but much more slowly than in a healthy subject. Sometimes a few extrasystoles occur, when the effort of the dyspnea is more marked than usual. These observations correspond to those which have been made on British and American soldiers in the condition which has received the name of "soldier's irritable heart." They may be the result of overwork in a heart suffering from latent myocarditis consecutive to some infectious disease or, in common with the rest of the organism, affected by general depression as the result of a toxinfection; but the irritable heart of the soldier may also be the result of true cardiac fatigue. In these last cases, it will be found that the patients, since their childhood, experienced difficulty in keeping up with their comrades in playing and running. It is easy to understand that in subjects predisposed by constitutional circulatory debility, cardiac fatigue may easily be produced as a result of the violent efforts, of the emotions and commotions caused by the state of war. Dr. Lian recommends rest and the administration of strychnin. After several days in bed, the patients may be allowed to get up and help the staff of the ambulance. It is not desirable to prolong absolute rest too much, for these patients have only too much tendency to allow their cardiac troubles to dominate them, as Mackenzie used to say. After several weeks in the ambulance, they can as a rule rejoin their corps, but it is generally necessary to note them for exemption from the harder physical work.

THE EXTRACTION OF INTRACEREBRAL FOREIGN BODIES

At the same meeting, Dr. Tanton read a note on extraction of intracerebral foreign bodies. The presence of projectiles in the brain does not count in the immediate prognosis, as far as life is concerned. On the other hand, it is a point of capital importance in the genesis of septic complications, early, secondary or late. Heretofore, it has been the practice to limit the disinfection of penetrating wounds of the brain to the orifice and the first centimeter or two of the track, abandoning systematically any attempt to search for the foreign body. The practice, however, has been tending for some time toward a more complete primitive operation with extraction of projectiles. The removal of intracerebral foreign bodies should be systematic and immediate, with the two conditions, nevertheless, that it shall be materially possible, and that it shall not itself add a new element of gravity to the condition of the patient. This last restriction applies particularly to foreign bodies of small volume, in size below that of a lentil. In these cases, primitive tolerance is the rule, and definitive tolerance is a probability. Extraction should be performed to avoid septic accidents. Moreover, the utilization by the forceps of the track already dug in the cerebral substance by the projectile avoids the necessity of further disorganization of the cerebral substance. Secondary extraction is reserved for cases in which certain clinical indications give rise to fear of septic accidents. Late extraction is almost invariably a side issue of an intervention whose main object is the evacuation and drainage of an intracerebral abscess. Local or regional anesthesia is essential. Before operating, unless the condition of the wound shows clearly that one has to deal with a tangential track, one should examine the patient by roentgenoscopy to determine whether or not there exists a foreign body. The operation is divided into two parts, but it must be completed at one sitting. The first stage consists of the disinfection of the cranial wound. The second includes the extraction of the foreign body with the aid of the screen. The manipulations for the extraction of foreign bodies are by no means always easy or innocuous. After contact has been established with the bullet by means of the forceps, it will sometimes be impossible to seize it. For these reasons, the use of the electromagnet controlled by screen observations is to be preferred, as it suppresses the delicate operation of seizing the projectile, and shortens the manipulations. Drainage of the intracerebral cavity is in all cases indispensable.

INJECTION OF EPINEPHRIN FOR COLLAPSE AFTER ANTITYPHOID AND ANTIPARATYPHOID VACCINATION

Dr. Lian has reported to the Réunion médicale de la IV-e Armée two accidents resulting from mixed antityphoid and antiparatyphoid vaccination. There was a general syndrome of an acute suprarenal insufficiency, namely, fever, headache, vomiting, profound depression, vertigo, faintness, very low arterial pressure, the "white line" of Sergent, and in the graver one, hiccup, epigastric and lumbar pain, oliguria and albuminuria. These troubles disappeared in four days in one patient, and in twelve in another. Although the appearance of this intolerance is difficult to explain in these two patients (there being no contraindication and no marked reaction in other subjects treated with the same vaccine), the clinical character of these manifestations is not surprising. It is a rule to see typhoid and paratyphoid infection accompanied by profound depression and very marked arterial hypotension. One can, therefore, understand that in case of intolerance of injection of sterilized cultures of typhoid and paratyphoid bacilli, there should occur a syndrome of acute suprarenal insufficiency. For these reasons, Lian is inclined to believe that in this exceptional reaction of intolerance to typhoid and antityphoid vaccines, there is a great fall of arterial pressure, and he recommends in such cases, if the pulse is small and easily obliterated, the subcutaneous injection of epinephrin chlorid solution (from two to four injections of 0.5 mg. in twenty-four hours). It is to be hoped that this treatment will give as good results in such cases as in the analogous but more serious and more

frequent accidents accompanying the intravenous injection of salvarsan and neosalvarsan.

Dr. Levy stated that he had observed in a man, aged 35, as the result of an injection of antiparatyphoid vaccine, threatening collapse, a temperature of 40.2 C. (104.4 F.) pulse uncountable and cyanosis of the extremities. In this case, the administration of epinephrin gave the happiest results. Nevertheless, Dr. Levy is of the opinion that to attribute these symptoms entirely to suprarenal insufficiency is going a little too far.

HEMERALOPIA

The frequence of hemeralopia, extremely low in time of peace (1 in 12,000 in France, according to Walter), undergoes an augmentation in wartime. At Verdun, Dr. Bourdier found 8.78 per cent. in ocular examinations during the winter of 1914-1915. At the same period, there occurred in the German army a grave epidemic of this condition. More recently, Vejers has observed it in proportion of 10.2 per cent. This high figure depends on many causes, some peculiar to the present war, which presents conditions different from those which have prevailed, in the past, such, for example, as the higher mean age of the combatants. The hemeralopia in the present war differs from those which have been described in previous wars in two respects: In the first place, there has been no epidemic, and, the revictualing of the army being satisfactory, there have been no crises of hemeralopia due to privation and physiologic misery. By reason of selection, symptomatic hemeralopia is rarely found more in military than in civil life. In most cases it seems related to some vice of refraction and principally to myopia. The condition has been observed among volunteers in the early months of the war, among officers of the regular army and medical officers, and because of these facts and others contained in the reports of the commanding officers and because of the isolated character of each case, it is evident that, in the present war, hemeralopia is a symptom rarely invoked by malingerers. Except for those cases traceable to general diseases (of liver and kidneys) or to ocular fatigue or disease, there seems to be no satisfactory treatment for the condition.

With regard to military employment of patients suffering from hemeralopia, the requirements of the command must be taken into consideration, and it is necessary to point out to commanding officers, whose complaints have been occasionally rather pointed, that the condition appears to be scarcely if at all curable; that those affected by it should be distributed at the front among the day working parties. In examining men for their aptitude for different special services, the experience of the present war has shown that in the future it will be necessary to control not only the visual acuity and the visual field, but also the power of adaptation to varying degrees of illumination. This is especially true of candidates for the posts of aviator and automobilist. Ametropia constitutes an inferiority not only because of the loss of visual acuity but also because of the hemeralopia which accompanies it. ["Hemeralopia" means, strictly, day-blindness, but is also used for night-blindness, more usually termed "nyctalopia." Our correspondent seems to be using it in the latter sense.—ED.]

THE WAR AND COLD STORAGE MEAT

On all sides a very marked movement has shown itself in favor of the importation of cold storage meat. Recently, the Conseil général du département de la Seine voted an annual subsidy of 100,000 francs ($19,300) toward the organization of the sale of cold storage meat by the cooperatives. An important question which has been raised is that of the lowering of the price at the port of delivery. It is well known that the great demands of the allied armies have caused a very considerable rise in the price of meat. This increase is particularly felt in France because these prices are quoted in sterling, and, therefore, we have to bear the loss on exchange. It is true that our colonies, Senegal and Madagascar, are already contributing to the revictualing of France in meat, but the quantities imported from these colonies are very small as compared with those which we receive from South America and especially from Uruguay. This is owing to the fact that the frigorific industry was in its infancy in this country at the moment of the outbreak of the war, but it is also due to the insufficiency of the means of transportation between our colonies and France. For more than a year the government and Parliament have been studying the means of endowing France with a frigorific fleet to facilitate the importation of chilled meat. The problem has been solved in a very satisfactory manner as regards transportation between South America and France. The French navigation companies, as the result of long negotiations, have decided to establish a line of ships for this purpose with a total capacity of about 80,000 tons.

The Treatment of Wounds by Sugar

At one of the recent sittings of the Société de pathologie comparée, Dr. Lboste drew attention to the fact that he had on several occasions availed himself, in veterinary surgery, of the cicatrizing properties of sugar by powdering the wounds with this substance after washing them with salt water. In a few days, the wound takes on a healthy appearance and heals rapidly. Dr. Grollet expressed the hope that this method of treatment would be tried in human surgery, in which it might hold its place in the treatment of septic wounds. It should be noted that the antiseptic properties of sugar have been long known, and in popular medicine this substance has always been considered to possess cicatrizing properties. At one time sugar alone or associated with naphthalene or iodoform was recommended as an antiseptic. Three years ago, Dr. G. Magnus of Marburg, as the result of experiments made in the service of Professor Koenig, recommended sugar as a practical and inexpensive dressing for wounds.

New Treatment for Chancroid

Dr. Goubeau has worked out a method of treatment for chancroid, based on the Czerny method, of which the following is the technic: The surface of each chancroid is cleaned by means of swabs of cotton soaked in ether, all traces of pus being removed. The clean surface of each chancroid is then swabbed with the following solution (with a small brush or with a rod around which a cotton swab is wrapped):

Sodium arsenate	1 gm.
Alcohol, 95°	50 gm.

The alcohol is evaporated by a current of air, leaving a fine film of sodium arsenate deposited on the surface and in the cavities of the chancroid. One chancroid is now swabbed a second time, the alcohol evaporated, and the chancroid dressed with aseptic gauze. This swabbing is repeated every day. It is rarely necessary to continue the treatment over more than three or four days. At the end of this time the chancroid is transformed into a small healthy red wound with a tendency to rapidly cicatrize. At this stage, one practices every day sponging with ether followed by dusting with iodoform. This method gives far more rapid results than any other. Healing is generally complete at the end of eight or ten days. When a bubo develops, Goubeau injects into the gland 1 c.c. of a 1 per cent. aqueous solution of sodium arsenate. This should be repeated, if necessary, every two days. If pus has already formed, it should be evacuated by a small trochar, and the solution of sodium arsenate injected immediately afterward. The cure of the bubo is obtained with great rapidity.

Marriages

RALSTON IRVING LEWIS, M.D., Glen Ellyn, Ill., to Miss Virginia Folkes, at Western Springs, Ill., about August 30.

CLOYD FRANKS WARTON, M.D., Akron, Ohio, to Miss Florence Elizabeth Mitchell of Ashland Ohio, August 23.

GROVER FRANCIS POWERS, M.D., Baltimore, to Miss Beatrice Farnsworth of South Lincoln, Mass., August 21.

ARTHUR N. FOSTER, M.D., Dorchester, Boston, to Miss Amy M. Wentworth of Brookline, Mass., August 15.

JACOB HENRY MATTHAI, M.D., Newberry, Mich., to Miss Emma Direxa Purcell of Chicago, August 9.

ALEXANDER AARON GOLDSMITH, M.D., to Miss Corinne Rosenfeld, both of Chicago, September 5.

FRANK A. ANDERSON, M.D., Austin, Chicago, to Miss Florence Steiner of Chicago, August 19.

LEO WILLIAMS BORTREE, M.D., to Miss Nellie Cheley, both of Colorado Springs, Colo., August 22.

JOHN THOMAS SAMPLE, M.D., to Miss Gladys M. Humphrey, both of Saginaw, Mich., August 8.

RICHARD ASBERY WALKER, M.D., to Miss Gertrude Hemstead, both of St. Louis, recently.

Deaths

Ernest Watson Cushing, M.D., Boston; College of Physicians and Surgeons in the City of New York, 1871; aged 69; formerly a Fellow of the American Medical Association; a member of the Massachusetts Medical Society, and American Gynecological Society; professor of abdominal surgery and gynecology in Tufts Medical School, Boston, from 1895 to 1913, and thereafter emeritus professor; editor of the *Annals of Gynecology and Pediatry* from 1887 to 1903; a member of the board of directors of the Robert Bent Brigham Hospital, Boston; a founder of and for more than twenty years surgeon to the Massachusetts Women's Hospital; founder of the Cushing Hospital, Roxbury, Boston; died in that institution, August 27.

Wilbur Boileau Marple, M.D., New York; Starling Medical College, Columbus, Ohio; 1881; aged 60; a Fellow of the American Medical Association; American Ophthalmological Society and New York Academy of Medicine; and a member of the American Therapeutic Association; ophthalmic surgeon of the New York Eye and Ear Infirmary; visiting ophthalmic surgeon to the Almshouse and Workhouse hospitals, Blackwell's Island, and consulting ophthalmic surgeon to the Babies' Hospital, New York; one of the best known ophthalmologists of the United States; died suddenly on the golf links at Kennebunkport, Me., August 30, from cerebral hemorrhage.

Edgar J. Spratling, M.D., Atlanta, Ga.; College of Physicians and Surgeons, Baltimore, 1891; a member of the Medical Association of Georgia; a member of the staff of the State Hospital for Epileptics, Palmer, Mass., from 1898 to 1900, and of the staff of the Matteawan State Hospital, Matteawan, N. Y., from 1904 to 1908; medical director of the Empire Life Insurance Company, Atlanta; captain of "F" Company, Fifth Infantry, Georgia N. G.; was shot and killed by a woman at the state mobilization camp, Macon, Ga., August 25.

Gabriel Archibald Elston, M.D., Corry, Pa.; New York University, New York City, 1880; aged 63; a member of the Medical Society of the State of Pennsylvania; and formerly president of the Erie County Medical Society; local surgeon of the Pennsylvania System; surgeon of the Corry Hospital; for several years a member of the local board of education; while hurrying to make a professional call, died at the Corry Station, from cerebral hemorrhage.

Morris J. Alexander, M.D., Tunica, Miss.; Louisville, Ky., Medical College, 1881; a Fellow of the American Medical Association; formerly president of the Clarksdale and Six Counties Medical Society, and a member of the Mississippi State Board of Health; died at his home, August 20, from the effects of a gunshot wound, self inflicted, it is believed, with suicidal intent while despondent on account of ill health.

William Henry Baker, M.D., Lynn, Mass.; Hahnemann Medical College, Philadelphia, 1880; aged 72; a veteran of the Civil War, in which he served both in the army and navy; a trustee of the State Colony for the Insane, Gardner, and of the Eliza Hahn Home for Aged Couples, Lynn; formerly surgeon-general of the Department of Massachusetts G. A. R.; died at his home, August 22.

Raymond W. Smith, M.D., Springvalley, O.; Louisville (Ky.) Medical College, 1893; aged 53; formerly a Fellow of the American Medical Association; while returning from an automobile trip through Vermont, jumped from his car near Newark, August 18, sustaining a fracture of the base of the skull, from which he died an hour later at the Newark City Hospital.

Ezra Bradway Sharp, M.D., Camden and Pitman Grove, N. J.; University of Maryland, Baltimore, 1888; aged 55; formerly a member of the Medical Society of New Jersey; formerly an instructor at the Polyclinic Hospital, Philadelphia; who, recently underwent operation at a hospital in Philadelphia; died at the home of his sister, in Camden, August 24.

George F. Clark, M.D., Winchester, Ky.; Medical College of Ohio, Cincinnati, 1895; aged 47; a specialist on diseases of the eye, ear, nose and throat; formerly a Fellow of the American Medical Association, and a member of the Kentucky State Medical Association; died at his home, August 20, from carcinoma of the throat.

John A. Mitchell, M.D., Newark, Ohio; Homeopathic Hospital College, Cleveland, 1880; aged 63; a Fellow of the American Medical Association; one of the founders of the Newark City Hospital, and a prominent practitioner of Newark; died suddenly at the Triton Club, fifty miles north of Quebec, August 19.

Charles M. Stoute, M.D., Middletown, Ind.; Physio-Medical College of Indiana, Indianapolis, 1891; aged 52; a member of the Indiana State Medical Association; Past Grand Sachem of the Improved Order of Red Men; was instantly killed by the overturning of his automobile, near Emporium, Ind., August 21.

Nevin Heckart Wireback, M.D., Pittsburgh; Memphis Hospital Medical College, Memphis, Tenn., 1906; a member of the State Medical Association of Texas; and for several years a practitioner of Wharton and Iago, Texas; died at his home, August 20, from nephritis.

Ernest B. C. Hanington, M.D., Victoria, B. C.; McGill University, Montreal, 1875; aged 65; local surgeon for the Canadian Pacific System from 1880 to 1885; once president of the Medical Council of British Columbia; died at his home, May 11, from heart disease.

Willis Gilbert Eaton, M.D., Lowell Mass.; Harvard Medical School, 1879; aged 62; formerly a Fellow of the American Medical Association; a member of the Massachusetts Medical Society; died at his home, June 26, from coronary sclerosis.

Edward L. Eastbrook, M.D., Minneapolis, Minn.; aged 70; Long Island College Hospital, Brooklyn, 1878; a midshipman in the navy and a lieutenant in the army during the Civil War; died in the Corey Hill Hospital, Brookline, Mass., August 20.

William Francis Waldron, M.D., Brooklyn; New York University, New York, 1898; aged 44; formerly a member of the Medical Society of the State of New York; died at his home in Greenpoint section of Brooklyn, August 24, from nephritis.

John P. Gilligan, M.D., Wilkes Barre, Pa.; Medico-Chirurgical College of Pennsylvania, Philadelphia, 1899; aged 44; a specialist on diseases of the eye, ear, nose and throat; died in Mercy Hospital, Wilkes Barre, August 11.

J. W. Knox, M.D., Lewisport, Ky.; Louisville, Ky., Medical College, 1876; aged 59; a member of the Kentucky State Medical Association; a member of the Kentucky Legislature in 1903; died at his home, May 31, from mastoiditis.

Thomas Powell, M.D., Los Angeles; New York Medical College, New York, 1858; aged 78; founder, president and medical director of the Powell Sanatorium, and author of many monographs; died at his home, August 16.

John Selby Pierce, M.D., Red Key, Ind.; Curtis Physio-Medical Institute, Marion, Ind., 1894; aged 52; president of the bank of Red Key; died in St. Vincent's Hospital, Indianapolis, August 16; after a surgical operation.

John D. Burch, M.D., Louisville; Kentucky School of Medicine, Louisville, 1876; aged 64; for many years a practitioner of Mead County, Ky.; died at the home of his daughter, in Louisville, August 12.

Edward E. Flagg, Mooreland, Okla.; (license, Oklahoma, 1908); aged 42; a practitioner since 1904; was instantly killed by the overturning of his automobile, thirty-five miles north of Mooreland, August 17.

William W. McDonald, M.D., Sayre, Okla.; University of Alabama, Mobile, 1889; aged 49; a member of the Oklahoma State Medical Association; died at his home, May 16, from glandular fever.

Augustus Assenheimer, M.D., New York; New York University, New York, 1868; aged 68; a member of the Medical Society of the State of New York; died at Far Rockaway, N. Y., August 24.

Stacey Watkins Boyle, M.D., Middlebury, Vt.; New York Homeopathic Medical College, New York City, 1908; aged 30; died suddenly in Colon, C. Z., August 21.

George B. Wilmuth, M.D., Springdale, Ohio; Eclectic Medical Institute, Cincinnati, 1864; aged 85; died at his home, June 12, from cerebral hemorrhage.

Edward Balch Knight, M.D., Providence, R. I.; Harvard Medical School, 1867; aged 72; died at his home, May 8, from valvular disease of the heart.

Zacharias Worth Neil, M.D., Verona, Tenn.; University of Nashville, Tenn., 1872; aged 68; died at his home, August 4, from heart disease.

J. S. Hill, Greensville, Tex. (license, years of practice, Texas); aged 62; died at his home, May 21, from nephritis.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

DR. MILES' RESTORATIVE NERVINE

According to the trade package, "Dr. Miles' Restorative Nervine":

"Is Recommended for the Following Ailments: Epilepsy, Hysteria and St. Vitus's Dance. Nervousness, Sleeplessness, Neuralgia, Nervous Dyspepsia, and Nervous Prostration. Headache, Backache, and Palpitation of the Heart due to functional or Nervous Disturbances. This Remedy is also useful as an aid to other treatment for Tobacco and Alcoholic Excess, the Opium and Morphin Habits."

The "Nervine" is but one of several "patent medicines" put out by the Miles Medical Co. of Elkhart, Ind. As is usual in such cases the advertising of each nostrum is used as a supplemental means of exploiting the remainder of the group. For instance, in the treatment of "Backache" we are told that "few remedies have a more beneficial effect in this disorder than the Restorative Nervine." However, if the pain is severe, the sufferer is urged to take, in addition, "Dr. Miles' Anti-Pain Pills" (an acetanilid mixture) and it is further suggested that "Dr. Miles' Liver Pills" will render the "treatment" still more effective. In chorea the "Nervine" is recommended, together with "Dr. Miles' Restorative Tonic" to "enrich the blood" and "Dr. Miles' Liver Pills" to be taken "as needed." For drunkenness and delirium tremens "give large doses of Restorative Nervine" followed by the use of "Dr. Miles' Liver Pills." Those who desire to overcome the alcohol habit are urged to take from six to nine teaspoonfuls daily of the "Restorative Nervine" and the same quantity of "Restorative Tonic," while for any pain "use Dr. Miles' Anti-Pain Pills."

Sufferers from epilepsy are told that "few remedies are more beneficial in the treatment of this disease than the Restorative Nervine." Should the patient not improve as rapidly as expected, the company urges that the case should be reported to it and its "specialist will give advice free of charge as to the best treatment in such exceptional cases." One is led to believe also that the morphin habit may be cured by the combined use of the "Restorative Nervine," "Restorative Tonic," "Dr. Miles' Liver Pills" and "Dr. Miles' Anti-Pain Pills": "If not benefited in a month write for advice." For rheumatism purchase a bottle of "Nervine" to which "add 1 ounce of salicylate of soda"; should the case prove obstinate add, in addition, "4 drams wine of colchicum," using of course, "Dr. Miles' Liver Pills" and the "Anti-Pain Pills."

The public is told that it must not infer—as it might possibly do—that "Dr. Miles' Restorative Remedies" are "cure-alls"; the company expressly insists that they are not. "There may be complications in your case that require the special advice of a skilled physician," if then the results obtained from "Restorative Nervine" are not satisfactory write to the Miles Medical Company and, if one is to believe the advertisements, "reliable advice will be furnished you by a competent physician."

Because of the number of inquiries that have been received about Dr. Miles' Restorative Nervine the preparation was analyzed in the Association's laboratory. A condensed statement[1] of the chemists' report follows:

1. The details of analysis will appear in the Reports of the Chemical Laboratory of the American Medical Association for 1916.

CHEMISTS' REPORT

"Dr. Miles' Restorative Nervine."—This preparation is a brown liquid having a sweetish-saline taste and an odor of a mixture of flavoring oils, among which the oils of lemon and cloves could be detected. Qualitative tests demonstrated the presence of ammonia (combined form), potassium, sodium, a small amount of calcium, a trace of iron, bromin, a small amount of chlorin and sulphate ion, also benzoic acid (combined form), sugar and color resembling caramel. From a consideration of quantitative determinations, which also were made, the following formula would produce a mixture essentially similar to the preparation:

Ammonium bromid (NH_4Br)	1.13 gm.
Potassium bromid (KBr)	9.87 gm.
Sodium bromid	6.93 gm.
Sodium chlorid	0.24 gm.
Sodium benzoate	0.85 gm.
Sugar	54.0 gm.
Caramel, sufficient to color	
Oil of lemon and cloves to flavor	
Water to make	100.00 c.c.

"The average single dose for an adult is given as two teaspoonfuls. Assuming one teaspoonful to be equivalent to 4 c.c. the total bromid content corresponds to 23.4 grains potassium bromid. This dose, given three times a day, makes the daily dose contain in bromids the equivalent of 70 grains of potassium bromid."

From the chemists' report it appears that "Dr. Miles' Restorative Nervine" is another one of the numerous bromid mixtures that have become so common since the passage of the Food and Drugs Act. The bromids, while powerful drugs, are not among those that the federal law requires must be declared, both qualitatively and quantitatively, on the label. The well marked physiologic effects of the bromids impress the public with the potency of any nostrum that contains them.

Every carton of the "Nervine" bears the statement in large letters:

"Dr. Miles' Restorative Nervine contains no alcohol, opium, morphine, heroin, chloral hydrate, chloroform, cocain, alpha or beta eucaine, cannabis indica or acetanilid."

It fails to mention that the nostrum *does* contain very definite quantities of the depressing bromids which, when taken in ignorance of their presence, may dose the sufferer into physical and mental inactivity. No wonder the "patent medicine" interests fight formula disclosure.

PULVOIDS CALCYLATES

Report of the Council on Pharmacy and Chemistry

Pulvoids Calcylates 5 grains was submitted by the Drug Products Company, Inc., New York, under the following claims as to composition:

"When ingested represents the following chemical formulas: $C_6H_4(OH)(COO)_2$ $Ca.2H_2O+Sr.(C_7H_5O_3)_2+2H_2O$."

"Strontium Di-Salicylate 2½ grs. and our especially prepared Salt of Calcium and Acid Salicylic adjusted in such nascent form that these pulvoids upon ingestion will promptly form Calcium Neutral Di-Salicylate 2½ gr."

"A combination of Calcium and Strontium Di-Salicylate, in seemingly true chemical union."

These statements are rather vague, possibly because they are an attempt to mystify. The product, however, may be assumed to be a mixture (not a chemical combination) of calcium salicylate and strontium salicylate. The therapeutic claims made for the preparation are:

"Superior to ordinary salicylates. Can be taken continuously and indefinitely without gastric irritation, insuring maximum efficiency."

"Reports show surprisingly good results, even where the sodium salt fails."

As there is no evidence to show that strontium salicylate, calcium salicylate or a mixture of the two salts has any advantage over sodium salicylate, these claims cannot be accepted. The name and the statement of composition are objectionable in that they do not reveal the identity of the drugs in "Calcylates" and in suggesting that this preparation possesses radical advantages over salicylates in other forms.

The Drug Products Company was told that the facts just mentioned rendered "Pulvoids Calcylates" ineligible for New and Nonofficial Remedies. The company in its reply objected to the Council's conclusions, and in support of its position

submitted testimonials from a number of physicians. The reply of the company embodied no facts or arguments which had not been considered by the Council's referee, and the testimonials from physicians contained no evidence to show that the combination has any real advantage over sodium salicylate.

The Council therefore declared "Pulvoids Calcylates" ineligible for New and Nonofficial Remedies for the following reasons: Unwarranted therapeutic claims are made for the mixture (Rule 6); the name does not describe the composition (Rule 8), and the mixture is an unessential modification of an established remedy (sodium salicylate) (Rule 10).

SECRETOGEN

Report of the Council on Pharmacy and Chemistry

The Council has adopted the following report and authorized its publication. W. A. Puckner, Secretary.

At the request of the Council, Prof. A. J. Carlson of the University of Chicago performed certain experiments on secretin and commercial products (Secretogen and Duodenin), said to contain secretin. He found no secretin present in the commercial preparations examined. His results further[1] showed that secretin itself is inert when given by mouth; this the Council has previously held. The Council endorsed Professor Carlson's findings.[2]

The Council has recently received from the manufacturers of Secretogen (the G. W. Carnrick Company), a letter practically acknowledging the correctness of Carlson's findings in these words:

"Professor Carlson seems to have quite well established that the so-called secretin preparations do not contain secretin to any appreciable extent, and that they are inert in laboratory experiments on normal animals."

The letter,[3] continuing, sets forth the company's claims for Secretogen on a wholly new and altogether improbable basis. Since the new arguments presented on behalf of Secretogen are merely speculative, the Council reaffirmed its previous action, declaring this preparation ineligible for New and Nonofficial Remedies.

Correspondence

Aromatic Spirits of Ammonia

To the Editor:—In the controversy regarding the efficacy of aromatic spirits of ammonia (The Journal, July 1, July 15 and August 12), each side is only partly right. The reason that ammonia does not dissipate shock or other forms of depression is not specifically that it is destroyed before it can reach the general circulation, as Dr. Wood says, but that drugs have no influence over depressed states. This principle is not generally expounded.

Aromatic spirits of ammonia is, however, not devoid of usefulness. A whiff of it, by virtue of its physical properties, resuscitates the depressed patient for a moment, at least, which is more than we get from digitalis and strychnin. The manner and intensity of this resuscitation may be of service in giving us an insight into the nature and extent of the depression. It is therefore deserving a place even in a restricted pharmacopeia, not as a life saver but as a useful agent.

Can we get the same results from whisky alone? Yes, but not in alcoholics. An aqueous solution of ammonia in sufficient concentration is inconvenient to use, and it cannot be fortified by aromatic oils as an alcoholic solution can. It is not a perfect preparation nor an ideal one; it is even a chemically incompatible solution; but it is the best pharmacy and pharmacology have as yet devised for the emergency outfit.

Reverting to the amusing incident of Dr. Wood and the country doctor, if the latter believed that a dose of aromatic spirits of ammonia rendered his patient safe he was surely in error, but not more than Dr. Wood, who attempted to abort shock by digitalis and strychnin.

Is it not logical to assume that aromatic spirits of ammonia in shock, mustard baths in collapse, and flagellation in opium poisoning, by awakening large areas of tissues toward autonomic augmented metabolism, are more rational treatment than hypodermic injections of nervines which seem to work as if lifting weights by short leverage?

As to who is to blame, the eminent authors who preserve superstitions, as Dr. Hotard contends, or the rank and file who follow blindly, as Dr. Wood insists, the answer must be, both! It is inexcusable, however, for an intelligent person to allow himself to be led blindly by eminent authorities to use such absurdities as decolorized tincture of iodin, N. F., or to believe that the "ethers" developed in tincture of iron make it a specific in erysipelas and nephritis.

J. Lanski, M.D., Chicago.

The Pasteurization of Milk

To the Editor:—With reference to the editorial on this subject in The Journal, Aug. 26, 1916, it is not correct to say that "the only valid objections to pasteurization, if indeed they are sufficiently tenable to be serious, come from the pediatricians who look with fear on a possible damage to the milk in point of digestibility or liability to the production of infantile scurvy."

With conditions as they are now or as they promise to be in any visible future, it has come to be universally admitted, so far as I know, by any one qualified to hold an opinion, that market milk should be pasteurized, by compulsion and under municipal supervision. Ask the milk-man; he knows, and, if he is frank, he will tell you how much milk he has had to refuse, this year in particular, as being absolutely sour and incapable of being rendered salable even by pasteurization. If this is true, then how much more comes just short of that point, containing from one-half to one billion bacteria to the cubic centimeter and having undergone butyric fermentation a little short of the obvious degree.

Just as surely as oil and water will not mix, just so sure is it that, if milk is to be rendered "absolutely safe"—save the mark—by pasteurization, dairy hygiene cannot be secured and enforced to the same degree as though it were to be distributed in the natural state.

While he has the highest interest in securing a milk free from bacterial contamination, the pediatrician is likewise very gravely concerned with the biochemical changes which may have occurred in the milk as the result of bacterial activity which may have ceased, as well as and *more than* —at the present time—those *caused by* pasteurization.

In a word, the pediatrician is most anxious to have the milk delivered in the nursery, or the milk laboratory, just as nearly as possible in the natural state in which it left the cow's udder, and then he can adapt it, lacticize it deliberately, if he choose, instead of casually through the bacteria accidentally present, pasteurize it, if so his judgment dictate: in fact, put it through any changes he wishes.

Finally, it is to be constantly emphasized that at present there is, probably long will be, and should be a special grade of milk, clinical milk Dr. Coit is fond of calling it, which deserves and should receive radically different management from the ordinary supply.

Walter D. Ludlum, M.D., Brooklyn.
President of the American Association of Medical Milk Commissions.

Healthgram.—He who has health has hope, and he who has hope has everything.—Proverb.

1. Carlson, A. J.; Lebensohn, J. E., and Pearlman, S. J.: Has Secretin a Therapeutic Value? The Journal A. M. A., Jan. 15, 1916, p. 178.
2. So-Called Secretin Preparations, The Journal A. M. A., Jan. 15, 1916, p. 208.
3. The letter is too long for publication here. It will appear, together with the Council's comment, in the Annual Reports of the Council. Reprints of it have been prepared and will be sent to any one who will send a two-cent stamp for it.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

SUBDURAL AND INTRAVENTRICULAR INJECTIONS

To the Editor:—Please give a detailed statement for making (1) subdural and (2) intraventricular injections.

HERBERT CALDWELL, M.D., Corpus Christi, Texas.

ANSWER.—1. Subdural or intradural injection usually refers to injection under the dura of the spinal canal. The technic is as follows: "The syringe employed for the injection is accurately graduated in drops. The patient is placed in a position for lumbar puncture, either sitting or lying, according to the choice of the operator. The puncture is then made with the needle, the end of which fits the graduated syringe. After a few drops of the spinal fluid have flowed out of the cannula, or a greater quantity if a diagnostic puncture is desired at this time, the syringe is fitted into the needle, and the fluid is allowed to run back into the syringe barrel, thus mixing with the amount of the drug in the barrel. The mixed spinal fluid and drug are then gently forced into the canal, and slight suction is made on the syringe to withdraw a second amount of fluid, which washes out the needle. This is then reintroduced, the needle is quickly withdrawn, and the patient placed in the Trendelenburg position, in which position he is allowed to remain for at least one hour."—Kolmer, John A.: Infection, Immunity and Specific Therapy. W. B. Saunders Company, Philadelphia, 1915, p. 806. See also Wile, Udo J.: The Technic of the Intradural Injections of Neosalvarsan in Syphilis of the Nervous System, THE JOURNAL, April 11, 1914, p. 1166.

Subdural injections are also made under the dura covering the cerebrum. From 10 to 20 c.c. of cerebrospinal fluid are usually first removed by lumbar puncture. The technic is similar to that of intraventricular injection, save that a shorter needle is used. (See Wardner, Drew M.: *Am. Jour. Insanity*, 1915, lxxi, 459.)

2. The following is a brief outline of intraventricular injection: "Under ether anesthesia, a small skin flap, slightly larger than the trephine used, is made a little in front of the bregma and 2.5 cm. from the sagittal sinus. A button of bone 1.5 cm. in diameter is removed and the dura incised. The slender cannula with blunt point is introduced at a point free from underlying cortical vessels, and passed downward and a little backward into the lateral ventricle. The head of the table is lowered, and from 10 to 20 c.c. of fluid allowed to escape. The head of the table is now raised, and a funnel containing the serum is attached to the cannula by short rubber tubing. The fluid enters entirely by gravity and is very slowly introduced. The cannula is then withdrawn and the scalp wound sutured. In the second and subsequent injections the scalp over the trephine opening is infiltrated with novocain, and the ventricular injection is carried out as described above. As the brain is not sensitive, a general anesthetic is not required in second injections."—Hammond, G. M., and Sharpe, Norman: The Treatment of Paresis by Injections of Neosalvarsan into the Lateral Ventricle, THE JOURNAL, Dec. 18, 1915, p. 2147.

The substances usually injected by these methods are neosalvarsan and salvarsanized, antimeningitis, normal and convalescent serums. The operations are not without danger to the patients, and the results are uncertain. (See Riggs, C. E.: Salvarsanized Serum in Syphilitic Nervous Disease, Some Salient Facts: the Method, the Drug, the Results, THE JOURNAL, Sept. 4, 1915, p. 841).

SOLUTIONS OF ALUMINUM ACETATE

To the Editor:—I wish some information on aluminum acetate and subacetate. In THE JOURNAL, July 24, 1915, p. 291, is an article by A. Ravogli on the treatment of burns by aluminum subacetate, and in the discussion of the paper the acetate is mentioned as the same as the subacetate. Ravogli uses the subacetate in a 2 to 5 per cent. solution, and when I attempted to make a 2 per cent. solution of the acetate, I found that it was practically insoluble in water. 1. Are the acetate and subacetate the same? 2. What is their solubility? 3. What is their value in burns?

A. W. PATTERSON, M.D., Fonda, Iowa.

ANSWER.—Some confusion may easily arise as to the difference between the two aluminum solutions. The National Formulary, Third Edition, described only the solution of aluminum acetate—a basic aluminum acetate solution. In the new National Formulary (Fourth Edition), however, the same solution is now described under the heading of "solution of aluminum subacetate," while there has been added a description of another and different solution, but labeled "solution of aluminum acetate." The latter solution is commonly called Burow's solution. "Solution of aluminum acetate," N. F. IV, prescribed as liquor alumini acetatis, contains about 5 gm. of neutral aluminum acetate $[Al(C_2H_3O_2)_3]$ per hundred c.c. The "solution of aluminum subacetate," N. F. IV, prescribed as liquor alumini subacetatis, contains about 7.8 per cent. of basic aluminum acetate $[Al(OH)(C_2H_3O_2)_2]$ per hundred c.c.

Pure aluminum acetate is quite soluble in water. However, the solid decomposes, losing acetic acid, and forming a complex basic mixture. This is not soluble, except on the addition of acetic acid. Hence, it is imperative that in preparing aluminum acetate solutions, methods such as are described in the National Formulary IV should be followed.

A dilute solution of aluminum acetate (or subacetate) is stated to be very efficacious in the treatment of Roentgen-ray burns, sunburn, etc. It is included in "Useful Drugs." It appears to be practically immaterial whether the normal or basic aluminum acetate is employed, except so far as concerns dosage. In case of the "solution of aluminum acetate," one part is used to ten parts water. The "solution aluminum subacetate" is used one part to fifteen parts water. It is probable that Ravogli referred to the solution which is now described as aluminum subacetate.

OXIDATION IN THE BODY AND DIET

To the Editor:—In THE JOURNAL, July 22, 1916, p. 249, a writer on the treatment of epilepsy, in speaking of the unquestioned benefits of life in camp or on the farm as it is exhibited in modern epileptic colonies, says: "There can be no doubt that the benefit is largely due to increased oxidation of waste and toxic substances," etc. Again, in discussing the regimen of patients, he remarks: "The diet should be so modified that in this organism, already toxic, as little strain as possible be placed on the liver, the thyroid and other defensive glands. For this reason the red meats are to be partaken of sparingly. The carbohydrates are also to be diminished. To take the latter in large amounts is to hamper the oxidation of the tissues, an oxidation which for the obvious reason of the autotoxicity of the patient should be maintained at as high a level as possible. In the diet, emphasis should be laid on the white meats, the succulent vegetables and milk; eggs also may be permitted."

Am I correct in assuming that the quotations here given present views which can scarcely be accepted as being in accord with the best current teachings of the physiology of nutrition? Certainly the vague generalizations about oxidation and the admonitions respecting the unlike dietary virtues of red and white meats are not in harmony with what one reads from time to time in your editorial columns.

A. T. N.

ANSWER.—In a recent editorial (Relation of Oxidation to Metabolism, Aug. 19, 1916, p. 622), THE JOURNAL commented on the inaccurate conceptions of the nature of oxidative processes in the organism still held by some physicians. There are few instances, if any—aside from cases of interference with oxidation locally in special organs or tissues—where the supply of oxygen is inadequate under ordinary atmospheric conditions. Oxygen is available in abundance; its use is determined by the requirement of the organism. In most instances so-called defective oxidation in the body is a misnomer.

Why red meats, composed of proteins and extractives and constituting muscles in one part of the animal body, should be forbidden while white meats, containing the same proteins and extractives in almost identical concentration in another part of the same animal body, are recommended for liberal use is never explained by those who formulate such prescriptions of diet. Aside from slight differences of texture the two forms of muscle tissue are essentially identical—at any rate for dietary purposes. If it is intended to avoid the undue ingestion of purins then *all* meats should be proscribed as well as fish, fowl and shell foods. If it is intended to reduce the protein intake, then it must be noted that eggs are quite as rich in albuminous constituents as are many forms of flesh. The red meat vs. white meat distinction ought to be abandoned except where it is desired to emphasize differences in palatability or culinary advantages represented by certain muscles such as the "white" meat of certain birds.

Finally, the statement that carbohydrates "hamper" oxidation in the tissues in the ordinary individual is not supported by the modern physiology of metabolism. So long as dietary advice is so largely based on empiricism, as it unquestionably still is, it seems advisable to avoid all attempts at explanations which will not stand the test of up-to-date investigations.

WRITER'S CRAMP

To the Editor:—I have a relative who has been troubled with writer's cramp for the past two years. Please let me know, personally or through THE JOURNAL, the most approved method of treating this condition. H. B. M., M.D., Los Angeles.

ANSWER.—The treatment of this condition is usually difficult and often unsatisfactory, even though the most approved methods have been faithfully employed. The general physical condition of the individual has some bearing on the condition, particularly if the patient is living a sedentary life. Regular general exercise, good nutrition and free elimination are at times helpful. The mental attitude of the patient is an important factor. Early cases may at times be arrested by teaching the patient to make the movements of writing with the entire forearm rather than with the fingers and wrist alone. It is also important to hold the pen loosely. Holding the pen between the first and second fingers is sometimes helpful. Placing the writing surface at an acute angle to the front of the desk or table is important. Absolute rest of the arm and hand for several months in a plaster cast is probably as efficient as any well known form of treatment. The cast should be removed from time to time, the arm cleansed with alcohol and dried and the cast replaced. The use of the hand too early may be the cause of failure. When the cast is finally removed, gradual exercise and massage should be employed for at least two weeks before the patient attempts to write. The effect of electricity is mainly psychic and at times harmful. Drugs used internally are of course of no value unless there is present some definite general disease which is amenable to drug medication.

SAFETY OF WATER SUPPLY FROM MISSISSIPPI RIVER

To the Editor:—I am anxious to know something of the contents of Mississippi River water. Will you be kind enough to tell me where I can secure an analysis of it. If this has been made at some other point, I would be very glad to get this analysis. For domestic purposes and as a drinking water, especially, I wish to know how it ranks, with regard to bacteria present. I refer to the untreated river water. Our town has for years been furnished with unfiltered river water in the mains, and it is frequently used without treatment, as filtering, chemicals or boiling. What is your opinion and what is the health authorities' opinion of this kind of water as compared to surface well water, cistern water, etc.? Are any towns or villages supplied with the Mississippi River water untreated? How many use the river water?

CITY HEALTH OFFICER, Arkansas.

ANSWER.—Analyses of Mississippi River water have been made at St. Louis, New Orleans and other points. Application to the water commissioners in the cities named will undoubtedly bring useful information. It must be remembered, however, that such analyses made at other points do not necessarily give the sort of evidence that is desired. It may well be that sewage enters a short distance above an intake and, as is well known, it is this fresh, nearby pollution that is most dangerous. Conditions on the watershed above the intake may afford a better clue to the actual danger than any analyses that have been made elsewhere. It is a pretty safe rule in general that a surface water, such as the Mississippi, unless specially protected against contamination, should not be used without purification. The chlorin treatment is so effective and so inexpensive that it can be advantageously used, pending the adoption of a more permanent method.

THE JOURNAL'S NEUTRALITY AND FOREIGN CORRESPONDENCE

To the Editor:—As a subscriber of many years' standing I take the privilege of asking a few questions. I notice with astonishment that since the war began you publish war medical news only from Paris and London. While I read this, I am only moderately interested in Paris and London. Before the war you published medical news from Vienna and Berlin also. I would appreciate it greatly if you could give me a satisfactory explanation of this fact, because if it is done for partisan reasons, I would cancel my contract immediately. If I want to read a political journal, I have the daily papers. I am not speaking for myself alone, but this is the opinion of many other physicians with whom I have spoken about this phenomenon.

ALOIS JOKL, M.D., Lackawanna, N. Y.

ANSWER.—The reply to this letter will be found in an editorial headed "Foreign Correspondence" (THE JOURNAL, Aug. 12, 1916, p. 517). In the meantime, we shall be very glad if our present correspondent will enlighten us as to how we can secure the letters from our regular correspondents at Berlin and Vienna, as well as medical journals from Germany and Austria.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

CALIFORNIA: Los Angeles, Oct. 3. Sec., Dr. Charles B. Pinkham, Room 527 Forum Bldg., Sacramento.
COLORADO: Denver, Oct. 3. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.
GEORGIA: Atlanta, Oct. 10-12. Sec., Dr. C. T. Nolan, Marietta.
IDAHO: Wallace, Oct. 3. Sec., Dr. Charles A. Dettman, Burke.
ILLINOIS: Chicago, Oct. 10-12. Sec., Dr. C. St. Clair Drake, Springfield.
IOWA: Des Moines, Oct. 17-19. Sec., Dr. Guilford H. Sumner, State House, Des Moines.
KANSAS: Topeka, Oct. 10-12. Sec., Dr. H. A. Dykes, Lebanon.
MASSACHUSETTS: Boston, Sept. 12-14. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.
MICHIGAN: Lansing, Oct. 10-12. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.
MINNESOTA: Minneapolis, Oct. 3-6. Sec., Dr. Thomas S. McDavitt, 814 Lowry Bldg., St. Paul.
MISSOURI: Kansas City, Sept. 18-20. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.
MONTANA: Helena, Oct. 3. Sec., Dr. William C. Riddell, Helena.
NEW YORK: Albany, Buffalo, New York and Syracuse, Sept., 19-22. Mr. Harlan H. Horner, Chief Examinations Division, The University of the State of New York, State Department of Education, Albany.
PORTO RICO: San Juan, Oct. 3. Sec., Dr. Quevedo Baez, San Juan.

Oklahoma April Report

Dr. Ralph V. Smith, secretary of the Oklahoma State Board of Medical Examiners, reports the oral and written examination held at Oklahoma City, April 11-12, 1916. The total number of subjects examined in was 11; total number of questions asked, 100; percentage required to pass, 70. The total number of candidates examined was 9, of whom 6 passed and 3 failed. Fifteen candidates were licensed through reciprocity. Six candidates were granted reregistration licenses. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Georgetown University	(1891)	81
Illinois Medical College	(1910)	70 *
Medical College of Ohio	(1907)	84
Hahnemann Medical College and Hosp., Philadelphia	(1915)	91
University of Tennessee	(1915)	76
Texas Christian University	(1912)	73

FAILED

Meharry Medical College	(1914)	64
University of Tennessee	(1915)	80 ‡
College of Physicians and Surgeons, Dallas	(1911)	61 †

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
University of Arkansas	(1912)	Arkansas
Atlanta College of Physicians and Surgeons	(1910)	Georgia
Georgia College of Eclectic Medicine and Surgery	(1910)	Arkansas
Hospital College of Medicine, Louisville	(1905)	Kentucky
Tulane University of Louisiana	(1901)	Mississippi
Baltimore Medical College	(1907)	Virginia
Boston University	(1900)	New Jersey
University of Michigan Medical School	(1901)	Michigan
Washington University	(1912)	Missouri
University of Nebraska	(1910)	Nebraska
Jefferson Medical College	(1891)	New Mexico
Meharry Medical College	(1914)	Tennessee
Memphis Hospital Medical College	(1912)	Mississippi
University of Tennessee	(1913, 2)	Mississippi, Tennessee

* Graduation not verified.
† Official records do not give this candidate as a graduate.
‡ Fell below the required average in one subject.

The following questions were asked:

PHYSICAL DIAGNOSIS

1. What is physical diagnosis? 2. Name some of the methods and technic of physical examinations. 3. Give clinical value of sphygmocardiography. 4. Describe technic of paracentesis. 5. What are the physical signs of a chest cavity? 6. Name the normal landmarks of the thorax. 7. Name three pathologic types of the thorax. 8. Diagnose spasmodic asthma. 9. Name the physical signs of pulmonary edema. 10. Diagnose all the stages of lobar pneumonia.

OBSTETRICS AND GYNECOLOGY

1. What is your method of delivery of a shoulder presentation; a face. 2. What is puerperal eclampsia? Give treatment. 3. Give pathology and symptoms of ectopic pregnancy. 4. What are the indications for cesarean section? What is Porro's operation? 5. What is placenta praevia? Give in full your treatment. 6. What is hydatidiform mole? Give treatment and caution in regard to same. 7. Give differential diagnosis of appendicitis, pyosalpingitis and cholecystitis. 8. Give diagnosis of carcinoma of uterus. Treatment. 9. Give causes and treatment

of leukorrhea. 10. What are vicarious menstruation, amenorrhea, dysmenorrhea, retroflexion, cystocele and rectocele?

PHYSIOLOGY

1. What is the mode of production of heat in the body? 2. State the function of the retina. 3. What do you understand by blood pressure? 4. How is the sensation of pain produced? 5. Describe the physiology of rectal feeding. 6. How are the vocal sounds produced? 7. What are the functions of the pancreas? 8. Describe the pons Varolii. 9. Describe the normal heart sounds. 10. Name the solids in the urine, and state the approximate amount of each voided daily by an adult.

BACTERIOLOGY

1. Give method of staining cover-glass preparations. 2. Define leukomains and ptomains. 3. Differentiate between *Bacillus influenzae* and pneumococcus. 4. Name and describe the malarial parasites. How does the blood picture differ in the quartan and estivo-autumnal parasites? 5. How would you grow the gonococcus? Give pathogenicity of the gonococcus.

PATHOLOGY

1. Give pathology of pleuritis. 2. What is the pathology of acute follicular tonsillitis? 3. What is the pathology of appendicitis? 4. Give pathology of puerperal metritis. 5. What is the influence of the nervous system on the process of inflammation?

MEDICAL JURISPRUDENCE AND TOXICOLOGY

1. In case of hanging what circumstantial evidence would you look for to determine whether the act was homicidal or suicidal? 2. Where a question arises as to personal identity, in what manner or by what test would you determine it? 3. What is malpractice? Civil and criminal? 4. When is it legally permitted to produce abortion? 5. What is infanticide? 6. Give the best antidote for arsenical poisoning. Mineral acids. 7. In what manner does death ensue in poisoning by hydrocyanic acid? By aconite? Morphin? Atropin? Strychnin? 8. Give symptoms of strychnin poisoning. Period when fatal. Fatal quantity. 9. Give symptoms of phenol poisoning. 10. Differentiate between opium poisoning and acute alcoholism.

ANATOMY AND HISTOLOGY

1. Bound the popliteal space, and name its contents. 2. Name, in detail, the structures involved in a cross-section of the thigh at the middle of lower third. 3. Discuss and classify articulations: (a) hip, (b) knee, (c) ankle. 4. Discuss the inguinal canal: boundaries, contents and surgical significance. 5. Name chambers, valves and membranes of heart. 6. Locate and describe Peyer's glands. In what disease are they involved? 7. Name the twelve pairs of cranial nerves. 8. Discuss briefly the encephalon and its membranes. 9. Give origin, course and two principal branches of the great sciatic nerve. 10. How many bones in the skeleton? Classify them and name bones of the skull. 11. Give origin and branches of the internal iliac artery. 12. Discuss the external markings and reflections of the pleura. 13. Give nerve and blood supply of uterus, spleen and tonsil. 14. Give lobes, vessels and nerves of the liver. 15. Discuss the histology of the mammary gland. 16. Discuss the histology of the stomach. Answer Question 15 or 16 and any other nine.

SURGERY

1. Give definition of meningocele; of encephalocele. Give treatment for meningocele. 2. Give treatment for acute septic arthritis of knee joint. 3. Give differential diagnosis between tuberculous infection of knee and osteomyelitis of upper end of tibia. 4. Give etiology of aneurysm in general and give symptom and treatment of aneurysm of popliteal artery. 5. At what point can vertebral artery be ligated most easily? How would you control hemorrhage of deep palmar arch, the result of punctured wounds? 7. Give treatment for fracture of nasal bones; for fracture of lower jaw. 8. Give symptoms and treatment of secondary syphilis. 9. Describe cataract and give treatment. 10. Name four general anesthetics. What are the contraindications to use of chloroform and ether?

CHEMISTRY

1. Give the antidote for iodin and formaldehyd. 2. How does potassium permanganate act as a disinfectant? 3. What is the law of chemical combination or constancy of composition? 4. What elements are constantly present in coloring matter of the blood, and what four elements enter into formation of all organic bodies? 5. What is an element? Name the lightest and the heaviest element. 6. Name the varieties of urinary calculi. 7. If on the addition of barium chlorid to a specimen of urine, there appears an intensely milky cloud, what does this indicate? What kind of diet would tend to diminish this condition? 8. What is the chemical name and formula for iodoform? 9. Give the specific gravity of abnormal urine and the abnormal constituents in urine. 10. Complete the equation: $C_2H_5CL + KOH =$ What.

HOMEOPATHIC PRACTICE

1. Give treatments for facial erysipelas. 2. Following typhoid, where there was emaciation and prostration and many large boils, give treatment. 3. What is eczema? Name forms and outline treatment. 4. Define ophthalmia neonatorum, cause and treatment. 5. In case of chronic constipation what would call for lycopodium? 9. Define scarlet fever and give treatment. 10. Give systems in malaria calling for eupatorium and china.

HYGIENE

1. How is malaria transmitted? How may it be prevented? 2. State the best method of disposing and disinfecting sputum. 3. Describe the several methods of purifying drinking water. 4. What hygienic precautions are necessary to produce a healthy sleep? 5. Describe the agency of the ptomains in inducing diseases and the disorders produced by them.

MATERIA MEDICA

1. Compare the action of morphin and atropin. 2. Give the physiologic action of veratrum and aconite, and name the diseases in which they are useful and state dosage. 3. What are the physiologic action of and medicinal uses of preparations of belladonna? 4. What is the official name of calomel? What drugs are incompatible with it? 5. Give the source, physiologic action and therapeutic action of oleum ricini.

PRACTICE

1. Describe the characteristics and significance of the several kinds of arterial pulse. 2. Give the physical signs of pleuritic effusion. 3. Differentiate between empyema and pulmonary abscess. 4. How would you diagnose pneumonia? 5. Differentiate between bronchitis and crupous pneumonia.

Book Notices

MODERN MEDICINE AND SOME MODERN REMEDIES. Practical Notes for the General Practitioner. By Thomas Bodley Scott, with a Preface by Sir Lauder Brunton, Bart., F.R.S. Cloth. Price, $1.50 net. Pp. 160. New York: Paul B. Hoeber, 1916.

In the preface, Sir Lauder Brunton says of those who read this little volume:

> Few, if any, will rise from its perusal without knowing something of which they were previously ignorant; and if other men qualified like Dr. Scott will follow the example he has set, and write down the results of their experience, the medical profession will gain greatly in knowledge, and patients will benefit greatly by improvement in treatment.

The book consists of four essays, on: (1) disorders of the heart, (2) arteriosclerosis, (3) therapeutic speculations and doubts, and (4) chronic bronchitis and bronchial asthma. These essays are essentially clinical. The author writes from a rich store of experience acquired by long, careful and unprejudiced observations. The matter bearing on the practical application of organic therapy is distinctly valuable. This is particularly true of the discussion of the various indications for thyroid gland medication. There is a tendency to be rather dogmatic at times in stating things which are still unproved, such as on page 27, where it is intimated that extract of the suprarenals is effective when given by mouth. The emphasis on the value of combination of drugs, as "iron, arsenic and strychnine; particularly in combination," is misleading. Names of manufacturing chemists and semiproprietary preparations are frequently mentioned (page 137). To recommend swimming, even in great moderation, for the treatment of the patient with a weak dilated heart is rather radical. The physiology is not always clear, and at times it is speculative. Yet despite these minor criticisms, this little book will help to keep alive the art of medicine. The author is surely an optimist in therapeutics when he says:

> If in therapeutics we lose faith and hope, we become in a measure paralyzed, and, what is perhaps worse, we develop an underlying feeling that we are sailing under false colors and are not giving a quid pro quo, or as Goodhart puts it, a *quo pro quid*. Today surely there is no room for faithlessness nor for hopelessness.

POLISH FOR USE IN THE CLINIC. By Rev. Francis Bimanski, Chaplain Cook County Hospital, Chicago. Paper. Pp. 16.

This is a short collection of questions most commonly used in obtaining the history from a Polish patient in a charity hospital. The questions are brief and made up largely of catchwords. Pronuciation is made quite plain. The booklet makes no pretense of being complete. To the physician who wishes to pick up enough Polish to help him in getting the history from one of that nationality who cannot talk English, the book will be found useful. We judge from its title that it is for free distribution by its author.

ENGLISH-ITALIAN PHRASE BOOK FOR SOCIAL WORKERS. Physicians' Supplement. By Edith Waller. Paper. Pp. 19. Price, 25 cents. Morristown, N. J.: The Author.

ENGLISH-ITALIAN PHRASE BOOK FOR SOCIAL WORKERS. A Phrase Book for the Use of Social Workers, Teachers, Physicians and Nurses. By Edith Waller. Paper. Price, 75 cents. Pp. 178. Morristown, N. J.: The Author.

This little book is an attempt to supply the social service worker, nurse or physician with some of the words, phrases and common colloquial expressions that he will be most likely to want to employ in his daily visits with the Italian working people. By consulting the index at the back of the book, it should be possible for the social worker to turn without difficulty from mustard plasters to fresh air; from the ever shoeless truant to pure milk for the baby, as the insistent moment demands. The grammatical ground covered is very limited, being chiefly the concrete application of a few common rules. These extracts from the introduction show the scope of the work. The author has been successful in her attempt, unusually successful, we think. The sentences are chosen with rare good judgment, the language employed is simple, and the style direct and colloquial. Difficulties in mutual understanding on the part of the Italian immigrant unfamiliar with English, and of the American worker trying to handle a foreign language as a working tool, are avoided

so far as this is possible. The book is distinctly above the grade of the conversation tables so frequently seen at the back of travelers' guides and pocket dictionaries. The physician's supplement, while not quite up to the level of the larger book, is also valuable. Both can be heartily commended.

HOSPITAL LABORATORY METHODS FOR STUDENTS, TECHNICIANS AND CLINICIANS. By Frank A. McJunkin, A.M., M.D., Professor of Pathology, Marquette University School of Medicine, Milwaukee. Cloth. Price, $1.25 net. Pp. 139, with 94 illustrations. Philadelphia: P. Blakiston's Son & Co., 1916.

"The purpose of this book is to place in the hands of the hospital laboratory worker and the technician of other small laboratories directions for the tests that are commonly required on specimens sent to such laboratories." The work embraces sections on the urine, gastric juice, feces, sputum, blood and bacteriologic, surgical and necropsy specimens. The manner in which the material should be handled before and after it reaches the laboratory is indicated in a specific way, and the simplest procedure by which the object of the analysis may be obtained with the greatest certainty is outlined in a detailed manner. No attempt has been made to interpret the laboratory findings, as this is rather the function of the clinician than of the laboratory worker. While this little book lays no claim to completeness, it is, nevertheless, sufficiently wide in scope to satisfy the needs of the general and hospital worker. Whenever there is necessity for more elaborate methods of analysis, larger works must be consulted. The choice of methods is excellent; the style of the text is clear and concise, and the illustrations are adequate. The book is recommended to all who may desire a short but adequate presentation of the laboratory methods requisite for the daily routine of practice.

HUMAN PHYSIOLOGY. A Text-Book for High Schools and Colleges. By Percy Goldthwait Stiles, Assistant Professor of Physiology in Harvard University. Cloth. Price, $1.50 net. Pp. 405, with illustrations. Philadelphia: W. B. Saunders Company, 1916.

This little volume, in the words of the author, aims to present concisely the accepted facts in physiology, with only a limited description of the experiments on which these are based, and with little or no reference to unsettled questions. A book written with this aim is necessarily elementary, too elementary for a college and medical school textbook, but on the whole acceptable for the high school. The book is well written, but the illustrations are not numerous enough, and some of those given are poorly executed.

Miscellany

Endorsement of Health Insurance by Health Authorities

At the conference of the United States Public Health Service with the health authorities of the several states and territories, held in Washington, May 13 and 15, at which twenty-three states and territories were represented, a resolution was unanimously passed adopting the report of the committee on health insurance favoring the establishment of government systems of health insurance.

Discussing the relation of health insurance to the medical profession and to established health agencies, the report of the committee calls attention to the fact that under such legislation as has been adopted in other countries, the local administration of health insurance funds is usually left to local boards created for the purpose, or to trade unions, industrial establishments or societies which have been approved by the central governing board or commission. The German act left the administration of the medical benefits to these local bodies, and this resulted at times in restricting the insured persons' choice of physicians to a limited number of contract doctors employed by these local agencies and thus has caused so much friction as to result in "doctors' strikes." The English act, in the effort to remedy this defect, permitted free choice of physicians registered on the panels of the funds, but did not place proper restrictions on the signing of certificates admitting insured persons to benefits. The result was that the physicians were too complaisant in signing certificates, and the funds were subjected to improper drain.

In the bills for health insurance that have been introduced in the several state legislatures, the German plan has been followed; the matter of providing medical benefits has been left in the hands of local bodies, and no provision has been made for correlating the system with existing health agencies. These are serious objections, since without such provisions a health insurance law will have little value as a preventive measure, although it may meet the approval of those who advocate it as a relief measure. There must be a close connection of the administration of any health insurance system with the health agencies of the country and with the medical profession. It is believed that this can be brought about (1) by providing staffs of medical officers in the federal and state health departments, to carry into effect the regulations issued by the central governing health insurance boards or commissions; (2) by providing a fair and sufficient incentive for the active cooperation of the medical profession, and (3) by providing for a close cooperation of the health insurance system with state, municipal and local health departments and boards.

It would seem best to place the administration of the medical benefits under governmental agencies and to provide that no cash benefits be paid except on the certificates of medical officers of the national and state health departments, acting as medical referees under the regulations of the central governing health insurance board or commission. Since these officers would be the representatives of the health departments in the funds, their selection and appointment should also be based on their knowledge of preventive as well as of clinical medicine. One of their duties should be to examine each disabled beneficiary and keep themselves informed as to the progress of his recovery.

With such a check on the payment of cash benefits, the medical and surgical treatment provided for beneficiaries could safely be left to the physician of the patient's choice, and payment made on a capitation basis regardless of whether the patient was sick or well, after the manner of the English national insurance act. This method of selection and payment of physicians for the medical and surgical relief would offer every incentive to them to keep their patients well and to endeavor to please by rendering their most efficient service. But, in addition, free choice should be allowed to those who prefer institutional treatment by a selected staff, when available; and to this end the local and federated governing bodies might even provide dispensary and hospital units, each such unit to include a staff of physicians, surgeons, oculists, dentists and other specialists, and a staff of visiting and bedside nurses.

The greatest value of such a system of administration of the medical benefits would be in the organized corps of medical officers and of attending physicians registered on the panel, and in the opportunity it would offer for preventing disease among the insured persons and their families. The objection could not be raised that such a corps would be too expensive. It would not require more than one such medical officer to every 4,000 insured persons, and at that rate they could more than save their salaries by relieving insurance funds from paying unjust claims. Furthermore, while an estimate cannot be made of the amount to be saved by their efforts in the way of lowering the sick rate, it is safe to say that it would amount to many times more than the sum of their salaries.

Health officials should realize, now, the necessity for correlating the administration of the medical benefits of any proposed health insurance system with existing health agencies. If health departments are at present inefficient, they should be strengthened and made adequate to meet all demands. To enact a health insurance law simply as a relief measure without adequate preventive features would be a serious mistake; but with a comprehensive plan for disease

prevention there is every reason to believe that it would prove to be a measure of extraordinary value in improving the health and efficiency of the wage-earning population.

The recommendations of the committee, which were adopted by the conference, are as follows:

The following fundamental provisions should be embodied in any health insurance measure proposed for national or state governments:

1. *Insured Persons.*—Every person engaged in a gainful occupation and earning less than a specified annual income, say $1,000, should be entitled to the benefits provided under the law. Every person earning more than the specified annual income should be allowed to qualify for the same benefits or greater benefits according to annual income.

2. *Funds.*—To be provided jointly by contributions from employees and employers; the government to appropriate for the expenses of supervision and administration.

3. *Benefits.*—The following benefits should be provided:

(*a*) Cash Benefits: Weekly cash payments in case of disability due to sickness, nonindustrial accident, or to childbearing by the beneficiary, for a period not to exceed twenty-six weeks in any one twelve-month period.

(*b*) Death Benefits: Cash payment (for funeral expenses) to legal heirs for death due to sickness or nonindustrial accident.

(*c*) Medical Benefits: To include adequate medical and surgical care, medicine and appliances in home, hospital, sanatorium, dispensary or physician's office, beginning with the first day of disability, whether due to sickness, nonindustrial accident, or to childbearing by the beneficiary or the wife of the beneficiary, and limited to a period of twenty-six weeks in one twelve-month period.

4. *Administration.*—All matters of promulgation of rules and regulations and appeals should be vested in a national or state commission created for this purpose. All matters of local administration should be vested in local boards of directors, federated according to districts, subject to supervision by the central authorities, and rules and regulations promulgated by the commission.

The commission and all local and federated boards should be composed of persons representing the contributors to the funds. The number representing employees and employers should be in the same ratio as their respective contributions.

Provision should be made for free choice of any physician registered on the local panel, and provision might be made also for adequate institutional care for those who prefer this method of medical benefits.

A corps of full-time medical officers should be provided within the national or state health service to have supervision of all hospital and dispensary relief; to examine all insured persons claiming to be disabled, and issue certificates in accordance with the regulations promulgated by the commission; to advise the administrative authorities and all contributors to the funds as to the best measures for the relief and prevention of sickness; to advise with the physicians attending sick members as to measures which will shorten the periods of disability, and to perform such other duties as may be fixed by regulations.

Sterilization of the Insane.—The annual report of the American Institute of Criminal Law and Criminology gives a summary of what the various states are doing as regards the criminal insane:

Indiana—No operations since 1908.
Washington—No operations had been performed before last year's report was written. No information has been received since then.
California—Insane, 634; criminal, 1. Since passage of law.
Connecticut—Insane, 21, since passage of law.
Nevada—No operations.
Iowa—No operation under old law.
New Jersey—No operations.
New York—No operations. Case pending before courts March, 1916.
Michigan—No operations.
Kansas—No information. No operations up to 1915.
Wisconsin—Feebleminded, 24.

So far as the committee has been able to ascertain, no attempt is being made to enforce any of the laws providing for the sterilization of criminals except in Washington, where the law is punitive.

Medicolegal

Evidence and Law as to Misbranding of Pink Pills

(Eleven Gross Packages, More or Less, of Dr. Williams' Pink Pills vs. United States (U. S.), 233 Fed. R. 71)

The United States Circuit Court of Appeals, Third Circuit, affirms a decree of forfeiture for averred misbranding of the packages of pills in violation of the amendment of Aug. 23, 1912, to the Food and Drugs Act. The court says that to its mind the words used in the statute are clear in meaning. The purpose of the act was, in the branding of drugs, to punish false and fraudulent statements regarding the curative or therapeutic effect of such drug or any of its ingredients. Limiting the extracts to locomotor ataxia alone, the court notes the branding complained of made the statement that the pills were: "Useful in locomotor ataxia and partial paralysis. . . . This remedy is offered to the public with full confidence in its efficacy in the treatment of diseases arising from or dependent upon impoverished blood, . . . rheumatism, leucorrhoea. . . . These pills are a valuable remedy for . . . sciatica, . . . and have accomplished beneficial results in . . . partial paralysis and locomotor ataxia. . . . Cases diagnosed as locomotor ataxia and as partial paralysis, and having characteristic symptoms have shown beneficial results under this tonic treatment, and in the cases under observation the resulting improvement has been lasting." The libel alleged that: "These statements were false and fraudulent in this: That they indicated to the purchaser thereof, and created in the minds of the purchasers thereof, the impression and belief that the said article was a remedy for, when in fact it was not a remedy for, locomotor ataxia, partial paralysis," etc. In support of its case, the government called several witnesses, physicians of proved ability, knowledge and experience, who testified that the pill would not, and why it could not, have any beneficial effects in locomotor ataxia and the other diseases named. They also testified to the fact that medical opinion was unanimous in so saying. It was also shown, and all of this without contradiction, that the pill was practically the well known Blaud pill, used generally in medical practice. It was complained that the testimony of these witnesses was not competent, being a mere expression of their personal opinions or views. But an examination of the proofs showed that the case was wholly different from one in which witnesses were testifying to their personal views on a controverted question of opinion. The testimony here was of fact, namely, that there was general, uncontroverted consensus of opinion. In the absence of countervailing proof in such matters, it was manifestly a question for the jury to determine the fair or fraudulent character of the branding statement. This question the court left to it, saying: If they were satisfied "that the pills were shipped in interstate commerce, with an honest belief on the part of those responsible for making the statement that they would do just what was stated on the label they would do, then it would be your duty to return a verdict in favor of the defendant." Referring to such statements, the court further said: "You will take those facts into consideration, and determine whether or not it was the intention of this language, interpreting it as an ordinarily intelligent man would, on the part of the claimants to convey the impression that they were to cure or act as a remedy for the diseases and ailments, even where the language does not directly say so. If it was the intention to so frame a statement that it conveyed those impressions, and those statements were false, and they are known to be false, or you can infer the intention to defraud, then it would be your duty to return a verdict in favor of the government. . . . If you believe from the evidence that any one of the therapeutic claims as to the effect of these pills upon locomotor ataxia, St. Vitus dance, sciatica, rheumatism, impotence, spermatorrhoea, or partial paralysis was false, and was made by the claimant with a reckless and wanton disregard as to whether it was true or false, you may find a verdict for the government." On the whole, it may be said the cause was properly tried and fairly submitted.

Damages Allowed for Malpractice in Treatment of Shoulder

(Hoffman vs. Watkins (Wash.), 155 Pac. R. 159)

The Supreme Court of Washington, on this second appeal in this action to recover damages for alleged malpractice in the treatment of an injured shoulder, affirms a judgment in favor of the plaintiff on condition of his remitting $1,600 from the $4,000 awarded him. The court says that the plaintiff, a man 54 years old, had been assaulted, knocked down, stunned and robbed, sustaining a cut over the eye and a severe injury to the right shoulder. At both trials the gist of the charge of negligence was the failure of the defendant to diagnose the injury to the shoulder as a dislocation. On the next morning after the injury, another physician called, treated the cut over the eye, and diagnosed the injury to the shoulder as a sprain. On the same or the next evening the defendant called and also diagnosed the injury as a sprain. Two or three days afterward the plaintiff visited the defendant's office, where the defendant claimed he again examined the shoulder and found it merely sprained. Each of these physicians testified that he examined the shoulder for a dislocation by inserting the fingers in the armpit, and also by placing the right hand of the patient on the opposite shoulder with the elbow pressed against the side or chest, and that by these tests it was determined absolutely that there was no dislocation. These two and every other physician who testified stated that these are infallible tests for any kind of dislocation of the shoulder, and that when the hand and elbow can be so placed the conclusion is invariable and absolute that there is no dislocation, but that if this cannot be done the contrary conclusion is just as absolute. But the testimony on behalf of the plaintiff tended to show that neither the other physician nor the defendant applied this or any other test, or attempted to lift, move or manipulate the arm in any way. In short, the evidence was conflicting, and the question of negligence was clearly one for the jury. Moreover, the sole controverted question being whether the defendant had applied these tests, it was unnecessary to submit to the jury the technical question as to what tests should have been made. However, the court thinks that the award of $4,000 damages was excessive. The evidence indicated that the shoulder had entirely recovered and was not giving the plaintiff any pain. While it was true that some of the effects of the operation which had to be performed were permanent in their nature, the evidence showed that the plaintiff's earning capacity was not materially diminished. It was true that he could not perform those tasks which necessitated lifting above the level of his shoulder, and that he had suffered much pain, inconvenience and considerable expense. Yet the joint, so far as the evidence showed, was otherwise unimpaired. In another case, similar to this in many respects, but where the results were much more serious, it was required that an award of $5,500 should be reduced to $2,000. So, everything considered, the court would make the judgment here $2,400 and costs, to bear interest from the date of its original entry.

May Express Opinions But Not Conclusions

(Taylor Coal Co. vs. Miller (Ky.), 182 S. W. R. 920)

The Court of Appeals of Kentucky holds that it was error to ask physicians, not for an expression of opinion, but for their conclusion, as to whether or not the injuries received by plaintiff Miller caused his tuberculosis. The court says that it was insisted that this principle is applicable only when a hypothetic question is submitted to an expert, and should not be applied when the expert is testifying after a personal examination of the person concerning whom he is called on to express an opinion. But the court does not see how any sound distinction can be made in the application of this rule between the answer to a hypothetic question and the answer to a question based on personal observation. Whether the witness is testifying as an expert from information imparted to him by a hypothetic question, or from information gained by a personal observation, he is in both instances called on to give an expression of opinion arrived at from information received by him, and in neither case should he be asked or permitted to give more than an expression of his opinion. An expert who is called for the purpose of enlightening the jury concerning a matter that they might not understand without the assistance of some person skilled in the particular matter under consideration is allowed to give his opinion for the benefit of the jury, but not to express a conclusion on his opinion, as that is the province of the jury.

Society Proceedings

COMING MEETINGS

Am. Assn. for the Study and Prev. of Inf. Mort., Milwaukee, Oct. 19-21.
Am. Assn. of Obstetricians and Gynecologists, Indianapolis, Sept. 25-27.
American Association of Railway Surgeons, Chicago, Oct. 17-19.
American Electro-Therapeutic Association, New York, Sept. 12-14.
American Public Health Association, Cincinnati, Oct. 24-27.
American Roentgen Ray Society, Chicago, Sept. 27-30.
Idaho State Medical Association, Twin Falls, Oct. 5-6.
Indiana State Medical Association, Ft. Wayne, Sept. 27-29.
Kentucky State Medical Association, Hopkinsville, Oct. 24-27.
Minnesota State Medical Association, Minneapolis, Oct. 11-13.
Missouri Valley Medical Society, Omaha, Sept. 21-22.
Nevada State Medical Association, Reno, Oct. 10-12.
New Mexico Medical Society, Albuquerque, Oct. 11-13.
Oregon State Medical Association, Portland, Sept. 14-15.
Pennsylvania State Medical Society, Scranton, Sept. 18-21.
Utah State Medical Association, Salt Lake City, Sept. 12-13.
Virginia State Medical Society, Norfolk, Oct. 24-27.
Wisconsin State Medical Society, Madison, Oct. 4-6.

MICHIGAN STATE MEDICAL SOCIETY

Fifty-First Annual Meeting, held at Houghton, Aug. 16-17, 1916

(Concluded from page 768)

End-Results in the Treatment of Cancer of the Uterus

DR. H. W. HEWITT, Detroit: In the surgical treatment of cancer of the uterus, there has been an extension of the limits of operability and an increase in the number of five year cures. Cautery treatment and the combined cautery have their uses, as has also radical abdominal hysterectomy. In the treatment of cancer, combined roentgenotherapy with hysterectomy is desirable in operable cases and combined roentgenotherapy and the cautery in inoperable cases.

DISCUSSION

DR. JAMES T. CASE, Battle Creek: Dr. Hewitt has given us a sane view, so far as treatment is concerned. There is no reason why a surgeon should confine himself exclusively to the surgical treatment of this condition, and the same may be said of the roentgenologist, or the man who believes solely in the cautery method. I take a definite stand in favor of operation for every operable case. I have not seen a single case in my own experience in which there has been an actual cure of cancer of the uterus by the radiotherapeutic method.

DR. RICHARD R. SMITH, Grand Rapids: There has been a great deal of discussion in the last few years regarding the use of the Roentgen ray in the treatment of cancer of the uterus, so that we are apt to be confused. We do not distinguish clearly between what are cures and what is simply temporary relief. No method has yet been discovered for curing uterine cancer. There is no method but what yields essentially more deaths than cures, and a cure for uterine cancer has still to be discovered.

DR. LESLIE H. DEWITT, Kalamazoo: I believe the Percy method of treatment is the best for the class of cases under discussion. When Percy began this treatment he used the red hot soldering iron. We treated a series of thirty or forty cases in the University Hospital with this method, but the end-results were very poor. The iron was used hot, a cherry heat. These patients died quickly. Many of them developed quickly vesicorectal fistula and did badly. With the improved method of using a mild amount of heat, which is now advocated by Percy, much better results can be expected. Several cases have been treated in Kalamazoo by a surgeon by the slow heat method and later on hysterectomy performed, and the pathologist at the state hospital was unable to find any cancer cells present.

Peace and War in the Human Organism

DR. F. MCDEE HARKIN, Marquette: We should give the human organism a clean heredity by proper legislation controlling marriages and permitting the asexualization of the manifestly degenerate; but better still would be a propaganda of education, beginning in the schoolroom and based on the Biblical injunction "Know thyself." We should utilize and improve on every existing measure of child protection and social reform, from fresh air funds and the prohibition of exhausting child labor, to sanitary housing, playgrounds for old and young, social centers that are more attractive than the saloon, and popular education on vital subjects by the lectured moving picture show. Greater prominence should be attached to the full-time health officer whose work in the schoolroom and in matters of sanitation is not yet half appreciated, and who should be among the best paid and most respected of our citizens. There should be the employment of all legitimate means of exploiting the truth with regard to fake medical nostrums, from "oxydonor" tin tubes to Christian Science adumbrations of the spirit, which latter cult, with its ostrich-like head in the sand nescience, never seems to recognize the limitations of the basic fact of the centuries that faith and a cheerful spirit are but factors, and not always essential in numberless therapeutic measures which are positively indispensable.

Age and Arterial Degeneration

DR. B. A. SHEPARD, Kalamazoo: Attention in the past to sclerotic changes in the artery has largely centered about the intima. Rokitanski believed that cells were deposited directly from the blood stream on the intima; Virchow believed that there was some formative stimulus and that the thickening was an inflammatory hyperplasia; Thomas maintained that the thickening was a compensatory thickening of the vessel wall to diminish the lumen of the blood vessel, the increase of which was due to increased blood pressure; this presupposes that the increased blood pressure antedates the beginning of the thickening.

All these men looked on the intima as the location of the primary changes; but Koster and others maintained that the degenerative changes of the arterial wall had their origin in the adventitia and infiltration from there to the media through the vasa vasorum. Koster determined that except in the brain and lungs the vasa vasorum do not pass deeper than the outer third of the media, but in the brain and lungs there was a fine capillary network penetrating the deeper layers of the media and along the medial surface of the elastica interna. This is of special interest in the study of brain syphilis. A close study of the structure of the artery, especially the media, is held by some to argue against the theories brought out of degeneration of the whole wall due to direct irritation of the intima from the blood stream. My own view is that the etiologic factors, by this meaning the toxic agents either chemical or bacterial, may come either through the blood stream in the lumen of the artery or through the vasa vasorum; the latter I believe the principal source, especially for bacterial factors. Thus I believe that most bacteriologic degenerative changes originate as a mesarteritis rather than as an endarteritis.

As an etiologic factor, syphilis is the most frequent of any of the factors which are definitely known to be in themselves solely responsible for arterial degeneration. It is quite generally believed by observers that mesarteritis due to syphilis is liable to affect the first part of the aorta, but it has quite a tendency to extend down to the sinuses of Valsalva and here produce constrictions about the mouths of the coronary arteries and result in weakening of the myocardium, and angina. Often the process is over the cusps of the aortic valves themselves, causing a deformity and shrinkage, thereby giving rise to an aortic insufficiency. In every case of aortic insufficiency, the possibility of syphilis as an etiologic factor should be considered.

A recent theory ascribes hyperactivity of the suprarenals as important in the production of arterial degeneration. A contraction of the arterioles is produced, and consequently the vasa vasorum receive a diminished amount of blood, and the vessels are insufficiently nourished.

In our active treatment of the condition as found, the term "moderation" must apply. The mental as well as the physical activities should be well considered. One of the first demands is usually that of toxemia from faulty metabolism and deranged digestive processes and removal of foci of infection. Closely related to this is the action and relation of the diaphragmatic muscle with its impaired function and resulting effects on the splanchnic vessels and gastric motility during digestion, together with its effect on the respiration and oxygenation.

In those cases showing renal inadequacy, I have seen considerable benefit from the use of potassium or sodium citrate. The solids in the urine will gradually increase, and then, too, it is sudorific in its action.

Adhesions of the Pelvic Colon

DR. JAMES T. CASE, Battle Creek: The present terminology refers to that portion of the colon from the crest of the left ilium to the inner border of the left psoas muscle as the iliac colon; and from this point to the front of the body of the third sacral vertebra as the pelvic colon. The pelvic colon is normally freely movable, and the proper function of the pelvic colon and rectum as a mechanism for accumulation and periodic discharge of fecal matter depends on this movability of the pelvic loop. The pelvic colon is normally more or less fixed, owing to the shortness of the mesocolon at this point, but the middle of the pelvic loop should rise during the accumulation of fecal matter. Normally the act of defecation clears the colon below the splenic flexure. When the pelvic loop is adherent or, being very long, incarcerated, the evacuation is complete. These adhesions should be proved both by enema and by test with the barium meal, under fluoroscopic guidance. The Roentgen findings should be considered with the other clinical findings. Enterospasm is an important symptom of adhesions, although it may be present without adhesions.

A serious question is raised as to the advisability of employing the pelvic colon as a means of covering up raw surfaces in the pelvis following pelvic operations. Care should be exercised to place the pelvic loop carefully to avoid, if possible, the production of binding adhesions which may later make the patient's life miserable on account of constipation.

DISCUSSION

DR. RICHARD R. SMITH, Grand Rapids: We have all been interested in the matter of covering in surfaces in the pelvis following operations to prevent adhesions, and have employed the pelvic colon for this purpose; but it has its limitations. I use the colon for covering in raw surfaces on the left side of the pelvis, but believe it is best not to attempt to crowd it down in the pelvis to cover such surfaces. To prevent adhesions I am now using a large rubber dam which was brought to the notice of the profession by Dr. Keefe of Providence, R. I. One can use a large piece of rubber dam. After bringing the omentum down over the intestine, the rubber dam is placed over it, leaving the surface smooth and apparently free from any traumatism.

DR. REUBEN PETERSON, Ann Arbor: The illustrations show beyond question that with reverse peristalsis in constipated women there is pain around the cecum, and they assume certain positions to overcome this pain. This leads to great difficulty in making the diagnosis unless some such method as Dr. Case has referred to is employed.

In the old days, when we used to cure patients primarily, they suffered a great deal afterward on account of adhesions of the pelvic colon. They suffered from all sorts of sequelae. We were not as careful about peritonization of the pelvis as we are now. These patients suffered from a gluing down of the pelvic colon in the pelvis. All of our methods of operating should be directed toward preventing these adhesions.

DR. JAMES T. CASE, Battle Creek: Pain in the cecum and in the region of the appendix is very common after appendectomy. Appendectomy has been done in such cases under insufficient indications. Patients have complained of pain, and their appendixes have been removed, but the pain still continues. It was not an appendical pain but a cecal pain. The appendix at operation in such cases does not look violently inflamed, and constipation after operation is a frequent thing.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Annals of Ophthalmology, St. Louis

July, XXV, No. 3

1 Intradural Tumor of Optic Nerve. E. C. Ellett, Memphis, Tenn.—p. 435.
2 Résumé of Experiments on Effects of Different Conditions of Lighting on Eye. C. E. Ferree and G. Rand, Bryn Mawr, Pa.—p. 447.
3 Spontaneous Absorption of Opacities in Crystalline Lens. S. H. Brown, Philadelphia.—p. 457.
4 Sclerocorneal Trephining Operation for Glaucoma. Report of Forty-Five Operations. W. R. Parker, Detroit.—p. 467.
5 Epibulbar Sarcoma. E. B. Heckel, Pittsburgh.—p. 474.
6 Six Cases Treated with Tuberculin, Including Cases of Keratitis, Choroiditis and Cyclitis. C. A. Clapp, Baltimore.—p. 478.
7 Optic Neuritis from Syphilitic Leptomeningitis. W. H. Wilder, Chicago.—p. 489.
8 Miners' Nystagmus. F. L. Hoffman.—p. 503.

Arkansas Medical Society Journal, Little Rock

August, XIII, No. 3

9 Arteriosclerosis. F. B. Young, Little Rock.—p. 45.
10 Common Fallacies in Technical Diagnosis of Indigestion. E. D. Holland, Hot Springs.—p. 48.
11 Differentiation Between Upper (Central) and Lower (Peripheral) Motor Neuron Involvement. G. B. Fletcher, Little Rock.—p. 50.

Boston Medical and Surgical Journal

August 24, CLXXV, No 8

12 Hygiene of Mind. B. P. Croft, Greenfield.—p. 251.
13 Mental Preparedness. J. J. Putnam, Boston.—p. 260.
14 Meaning of Mental Hygiene Movement. W. A. White, Washington, D. C.—p. 264.
15 Menace of Mental Deficiency from Standpoint of Heredity. H. H. Goddard, Vineland, N. J.—p. 269.
16 Functions of Social Service in State Hospitals. H. Curtis, Hathorne.—p. 271.

Bulletin of Medical and Chirurgical Faculty of Maryland, Baltimore

June, VIII, No. 12

17 Dispensary Abuse and Certain Problems of Medical Practice. J. W. Williams, Baltimore.—p. 229.

Florida Medical Association Journal, Jacksonville

August, III, No. 2

18 Lumbar Puncture and Examination of Spinal Fluid. R. N. Greene, Chattahoochee.—p. 33.
19 Interpretation of Wassermann Reaction. W. P. Dey and G. E. Henson, Jacksonville.—p. 40.
20 Diagnosis and Treatment of Syphilis. J. E. Gammon, Jacksonville.—p. 43.
21 Few Facts Concerning Complement. J. R. Bean, Jacksonville.—p. 48.

Journal of Biological Chemistry, Baltimore

August, XXVI, No. 1

22 Quantitative Comparison of Casein, Lactalbumin and Edestin for Growth or Maintenance. T. B. Osborne and L. B. Mendel, New Haven, Conn.—p. 1.
23 *Effect of Surgical Procedures on Blood Sugar and Renal Permeability. A. A. Epstein, J. Reiss and J. Branower, New York.—p. 25.
24 *Comparative Study of Behavior of Purified Proteins Toward Proteolytic Enzymes. E. M. Frankel, New Haven, Conn.—p. 31.
25 Metabolism of Sulfur. Relative Eliminations of Sulfur and Nitrogen in Dog in Inanition and Subsequent Feeding. H. B. Lewis, Urbana, Ill.—p. 61.
26 *Physiology of Phenols. H. Dubin, Philadelphia.—p. 69.
27 *Influence of Ingested Carbohydrate, Protein and Fat on Blood Sugar in Phlorizin Diabetes. F. A. Csonka, Pittsburgh.—p. 93.
28 Researches on Pyrimidins. Synthesis of Thymine-4-Aldehyd. T. B. Johnson and L. H. Cretcher, Jr., New Haven, Conn.—p. 99.
29 Cerebronic Acid. Relation of Cerebronic and Lignoceric Acids. P. A. Levene and C. J. West, New York.—p. 115.
30 Dialysis of Trypsin and Proteoclastic Action of Protein Cleavage Products. C. Funk, New York.—p. 121.
31 Influence of Ethyl Alcohol and Glycerol on Rate of Solution of Casein by Sodium Hydroxid. T. B. Robertson and K. Miyake, Berkeley, Calif.—p. 129.
32 Chondrosamine. P. A. Levene, New York.—p. 143.
33 Synthesis of Hexosamines. P. A. Levene, New York.—p. 155.
34 Physiologic Action of Glucal. J. O. Balcar, Chicago.—p. 163.
35 Formation of d-Lactic Acid by Autolysis of Pus. H. Ito, Japan.—p. 173.
36 Origin of Humin Formed by Acid Hydrolysis of Proteins. Hydrolysis in Presence of Carbohydrates and of Aldehyds. R. A. Gortner, St. Paul.—p. 177.
37 *Uric Acid Solvent Power of Normal Urine. H. D. Haskins, Portland, Ore.—p. 205.
38 Cell Penetration by Acids. Further Observations on Blue Pigment of Chromodoris Zebra. W. J. Crozier.—p. 217.
39 Id. Data on Some Additional Acids. W. J. Crozier.—p. 225.
40 *Feeding Experiments on Substitution of Protein by Definite Mixtures of Isolated Amino-Acids. H. H. Mitchell, Urbana, Ill.—p. 231.
41 *Digestibility and Utilization of Egg Proteins. W. G. Bateman, New Haven, Conn.—p. 263.

23. **Surgery and Renal Permeability.**—Operative procedures under anesthesia cause an increase in the blood sugar content (hyperglycemia), associated with a reduction or impairment of renal function. From this it is concluded by the authors that diminished permeability of the kidneys is responsible for the infrequent elimination of sugar in the urine after operation.

24. **Comparative Study of Proteolysis.**—It has been demonstrated that pepsin is the effective agent in pepsin hydrochloric acid digestion since hydrochloric acid alone in the concentrations ordinarily employed has very little proteolytic effect. As a result of a series of experiments the conclusion seems justified to Frankel that comparable results in proteolysis studies are to be obtained only when the substrates are in solution; otherwise deviations of 10 to 15 per cent. may be encountered in duplicate experiments. An examination of the digestion of thirteen proteins shows that there is a parallelism in the cleavage curves of all the proteins, if the cleavage is calculated as the ratio of the amino nitrogen liberated at any one time to that obtained on total hydrolysis of the protein with strong acid. Pepsin hydrochloric acid can liberate about 20 per cent. of the total amino nitrogen of a protein in less than 100 hours. Trypsin acting on proteins partially digested with pepsin effects a cleavage of about 70 per cent. The action of trypsin on native proteins can cause a cleavage of about 50 per cent. of the peptide linkages. Further addition of trypsin may cause further disintegration of the protein. Erepsin following the action of pepsin is a very effective agent in causing the disruption of the protein molecule. In two series of experiments cleavage of about 85 per cent. of the protein could be demonstrated. The successive action of pepsin, trypsin and erepsin liberates about 85 to 90 per cent. of the total amino nitrogen of the protein studied.

26. **Physiology of Phenols.**—The results of Dubin's investigation, in addition to confirming the findings of Folin, bring to light some interesting observations. The elimination of phenols from day to day is quite constant. Withdrawing water from the diet causes an increased phenol elimination. After Eck fistula, the free phenols represent as high as 97 per cent. of the total, the latter, as also the former, exhibiting a tendency to decrease. After intestinal obstruction, there is an increase in both free and total phenols, the former constituting as low as 55 per cent. of the latter. In pancreatic insufficiency, there is an increase in both free and total phenols with an accompanying decrease in the percentage of free phenols. After excluding the bile, both free and total phenols increase, but with an increase in the percentage of free phenols. The feeding of phenol and p-cresol results normally, with but slight variations, in the elimination of about 65 per cent. and 40 per cent., respectively. After Eck fistula, about the same excretion is noted. After intestinal obstruction, pancreatic insufficiency, and exclusion of bile, there is in both cases a drop in the amount excreted. The feeding of tyrosin results normally in an excretion of about 14 per cent., as phenols. After Eck fistula, practically the same amount is eliminated.

After exclusion of bile and pancreatic juice, about 20 per cent. of ingested tyrosin is eliminated. Feeding of any of the three substances causes an increase in the conjugation at all times—p-cresol to a greater degree than phenol, and the latter to a greater extent than tyrosin. Tyrosin, phenol and p-cresol, fed in amounts of 5 gm., 1 gm. and 1 gm., respectively, were all eliminated within twenty-four hours. No unchanged tyrosin could be demonstrated in the urine or

feces. Fasting reduces the phenols to a low level; the injection of phlorizin during fasting causes an increase in the output of phenols. It is impossible to free the urine entirely of phenols by the use of calomel. The bile appears to have some influence on the conjugating function of the liver. The phenols can be taken as an index of intestinal putrefaction.

27. **Phlorizin Diabetes.**—Following the ingestion of 20 gm. of glucose the blood sugar reached the maximum at the second hour, and declined to the original level at the fourth hour. In another experiment, it was shown that of 16 gm. of glucose given to a phlorizinized dog, 94 per cent. was excreted during the first five hours as extra glucose. The curve of the blood sugar content runs parallel with the curve of the extra glucose. Since the elimination of ingested glucose is practically complete and the curve of blood sugar runs parallel to that of extra glucose, the conclusion is reached that no glucose was deposited between the periods of absorption and elimination. The only difference observed in the blood sugar content after the ingestion of large quantities of glucose in a more concentrated solution (50 gm. of glucose in 150 c.c. of water) is that the hyperglycemia is maintained for a longer period of time. That the blood sugar is increased after ingestion of protein is apparent from the curve which shows that the endogenous glucose derived from meat protein and gelatin appears in the blood as glucose—at least, partially so—since the isoglucogenic quantities of ingested endogenous and exogenous glucose should give the same increase of blood sugar. The ingestion of fat, which does not produce extra glucose, did not cause any appreciable increase in blood sugar.

37. **Uric Acid Solvent Power of Urine.**—When shaken with uric acid for twenty minutes at 37 C., Haskins found that many urines that are slightly acid and all that are neutral or alkaline take up extra uric acid. The less acid the urine the more uric acid, as a rule, it will dissolve. Dilute urines when considered in proportion to their concentration show much greater solvent power than less dilute urines. Some urines dissolve so much uric acid that they come to contain more uric acid than is present in a saturated solution of monosodium urate. Haskins suggests that in all probability in these cases at least part of the uric acid is in colloidal solution.

40. **Feeding Experiments with Amino-Acids.**—Experiments are reported by Mitchell in which mice have been kept alive for seventy to ninety-eight days by feeding alternately (1) rations containing 4 to 6 per cent. of various mixtures of isolated amino-acids, 6 to 4 per cent. sucrose, 34 per cent. starch, 28 per cent. protein free milk (prepared either according to the procedure of Osborne and Mendel or to a modification of this procedure described in the text), 10 per cent. lard and 18 per cent. butter fat, and (2) a ration containing 10 per cent. sucrose, with other constitutents in the same proportion as in the first mentioned rations. In many of these experiments periods of fifteen to thirty-five days' duration have been observed in which the mice practically maintained their weight. The alternate feeding of an amino-acid ration and a nonnitrogenous ration (except for the nitrogen present in the protein free milk) induced a better total consumption of food than feeding with an amino-acid ration alone, and in all other respects led to more successful results. However, it is probable that in no case was the amino-acid intake sufficiently large to assure a fair test of its adequacy.

Amino-acid rations containing no added tyrosin, or no added tyrosin and phenylalanin, did not give appreciably different results from rations containing these amino-acids. However, if tryptophan was absent from an amino-aicd ration, the period of survival of mice fed this ration alternately with the nonnitrogenous ration was noticeably shorter than the periods of survival of mice kept on rations containing added tryptophan. Mice could be kept for much longer periods of time on rations containing mixtures of amino-acids, including tryptophan, fed alternately with the nonnitrogenous basal ration, than when fed the basal ration alone. Furthermore, this difference in survival cannot be accounted for by a difference in energy intake. This fact has been interpreted as meaning that at least some of the amino-acids have specific functions in metabolism aside from that of serving simply as material for the synthesis of body protein.

41. **Utilization of Egg Proteins.**—Raw egg-white, Bateman says, is a decidedly indigestible substance. It may cause diarrhea in dogs, rats, rabbits and man when ingested in any large quantity. Its utilization by the body is poor since it is used only to the extent of 50 to 70 per cent. Subjects can acquire a certain tolerance for the native protein after ingesting it for several days so that it no longer causes diarrhea and is somewhat better utilized. Raw egg-white can be made digestible through coagulation by heat; by precipitation with alcohol, chloroform, or ether; by incubation with dilute acids or alkalies; by partial digestion by pepsin; by conversion into alkali-metaprotein. The indigestibility of native egg-white probably lies either in its antitryptic content or in its chemical constitution. Its physicial texture appears to play a minor part in its behavior. Of the individual proteins constituting egg-white, the albumin fraction appears to be the indigestible component. The whites of the hen's egg and duck's egg act alike in causing diarrhea and in being poorly utilized. Egg-yolk either raw or cooked is excellently utilized. It sometimes causes digestive disturbances in dogs, apparently because of its high fat content. In current dietotherapy raw whole eggs, raw egg-white, and albumin water, are extensively prescribed. There appears to be little in their conduct as foodstuffs, however, to warrant such faith in their nutritive value or ease of assimilation.

Journal of Cancer Research, Baltimore

July, I, No. 3

42 *Teratomata of Brain. M. Barron, St. Paul.—p. 311.
43 Hereditary Transmission of Differences in Susceptibility to Growth of Transplanted Tumors in Various Strains of Mice. M. S. Fleisher and L. Loeb, St. Louis.—p. 331.
44 Precancerous Dermatoses. W. J. Heimann, New York.—p. 343.
45 Model of Gastric Tubules in Early Gastric Cancer. L. B. Wilson, Rochester, Minn.—p. 357.

42. **Teratomata of Brain.**—A study of the cases of brain teratomata discussed in the literature, Barron says, shows that tissues of mesodermic origin are the elements most commonly found in these tumors. However, excluding the case cited by the author there are only four examples (Strassmann and Streckner, Saxer, Gutzeit, and Newmann) in which there is reported the presence of striated muscle fibers. Similarly in only one other case (Saxer) is there described the presence of spaces lined with columnar epithelium containing goblet cells. Indeed, Saxer's resembles the present case more closely than any other. It is interesting to note that practically all the cases which developed symptoms from these tumors died before the twentieth year. The origin of such tumors is best explained by the inclusion of totipotential cells very early in the development of the ovum. The tumor here described presents derivatives from all three primitive germ layers. This tumor belongs to the embryonal type of teratomata originating most probably in the epiphysis.

Journal of Laboratory and Clinical Medicine, St. Louis

August, I, No. 11

46 *Immunity in Syphilis. H. Zinsser, New York.—p. 785.
47 Estimation of Sugar in Blood by Lewis-Benedict Method. Graph for Obtaining Directly Percentage of Dextrose. L. McDanell, New Haven, Conn.—p. 804.
48 Rôle of Cholesterol in Pathology. J. C. Small, Chicago.—p. 809.
49 *Complement Fixation Test in Tuberculosis. H. R. Miller, New York.—p. 816.
50 Quantitative Estimation of Phenol Tetrachlorphthalein Excreted in Fresh Bile in Disease of Liver. H. L. McNeil, Galveston, Texas.—p. 822.
51 Focal Infection. J. W. Shuman, Sioux City, Iowa.—p. 825.
52 Case of Progressive Lenticular Degeneration with Necropsy. C. Hunter and S. J. Peirce, Winnipeg, Canada.—p. 830.
53 Roentgenographic Studies of Cerebral Vascular Lesions. C. O. Dhonau, Cincinnati.—p. 836.
54 Stupid Words and Statements Commonly Appearing on Laboratory Reports. B. G. R. Williams and E. M. Williams, Paris, Ill.—p. 841.

46. **Immunity in Syphilis.**—Complete sterilizing immunity or, in other words, complete cure, Zinsser says, occurs but rarely without specific medicinal aid, and the untreated

syphilitic might go on to apparent cure, in that a general syphilization of his body would bring about a general resistance, but would always harbor virulent treponemata which could cause recrudescences in parts in which resistance was diminished, and eventually kill by degenerative processes in the central nervous system where many injuries cannot be compensated for as is possible in other organs. The resistance which develops is apparently a new attribute only of the cell groups which have undergone direct reaction with the treponemata. This resistance may consist merely in the complete failure of the tissue cells to react to the virus, a sort of "tissue indifference" or "Anergie." It may be, however, and probably is, accompanied by a certain amount of active defense in the form of local phagocytosis of the treponemata by the fixed tissue cells.

49. **Complement Fixation Test in Tuberculosis.**—Miller emphasizes the fact that complement fixation in tuberculosis is a definitely valuable diagnostic method which will occupy an important place among the practical methods of diagnosis.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

August, VIII, No. 8

55 *Cross Tolerance. Altered Susceptibility to Codein, Heroin, Cannabis-Indica and Chloral-Hydrate in Dogs Having an Acquired Tolerance for Morphin. H. B. Myers, New York.—p. 417.
56 *Absorption of Potassium Iodid by Thyroid in Vivo, Following Its Intravenous Injection in Constant Amounts. D. Marine and J. M. Rogoff, Cleveland.—p. 439.
57 Some New Time Recording Apparatus. W. Hale, Boston.—p. 445.
58 *Peripheral Action of Opium Alkaloids. Effect on Sensory Nerve Terminals. D. I. Macht, S. L. Johnson and H. J. Bollinger, Baltimore.—p. 451.
59 *Lethal Dose of Arsenic for Splenectomized Mice. C. Towles, Baltimore.—p. 465.

55. **Cross Tolerance.**—Myers claims that a marked crossed tolerance exists to codein and to heroin in dogs habituated to morphin, in so far as effects on the respiratory center are concerned. A slight crossed tolerance exists between codein and morphin, and between heroin and morphin in regard to their actions on the tissues governing equilibrium. Dogs tolerant to morphin when given codein or heroin have increased intestinal peristalsis. No evidence of crossed toleration to cannabis indica or to chloral hydrate exists in dogs tolerant to large amounts of morphin. The experiments cited by Myers show that a cross tolerance may exist between closely related drugs but that this tolerance is evidenced only on those functions in which the drugs have a common selective action.

56. **Absorption of Potassium Iodid.**—There is apparently no difference between in vitro and in vivo perfusions as regards the percentage of iodin absorbed. The absorption is practically instantaneous in each case. Maximum thyroid effects are produced by such exceedingly small amounts of iodin and the gland has such an extraordinary affinity for salts of iodin, that its loss through the kidney may be considered negligible, and this probably holds true for all other body tissues. The size of the gland and the stage of physiologic activity modify the amount of potassium iodid absorbed apparently to the same degree whether it is introduced by in vitro perfusion or injected intravenously in the living animal. The liver and spleen show no retention of potassium iodid, whether introduced by in vitro perfusion or by intravenous injection. With constant amounts of potassium iodid introduced and with glands of similar degrees of physiologic activity, there is no noteworthy difference in the percentage absorbed, whether the in vivo perfusion lasts one hour or thirty hours. There must be some slight increase in the amount of iodin absorbed from a single dose in the succeeding minutes or hours of a given experiment, but it was not sufficiently marked to be detected as an increase in the iodin content of the thyroid, in this series of glands with the methods employed; although after an hour it was not present in detectable amounts in the circulation.

58. **Peripheral Action of Opium Alkaloids.**—A quantitative study of the pain threshold before and after local application of various opium alkaloids, shows that they exert a distinctly measurable action on the sensory nerve terminals, producing a slight analgesic effect. In the order of their efficiency in this respect the opium alkaloids may be arranged as follows: Papaverin, narcotin, morphin, narcein, codein and thebain. A combination of total opium alkaloids was found to be more effective than the amount of morphin, or of papaverin or narcotin, it contains would be if given alone. The local effect of opium observed in this investigation by the authors agrees well with numerous empirical observations by clinical men in the past and present.

59. **Lethal Dose of Arsenic for Splenectomized Mice.**—It is concluded by Towles from her experiments that the body resistance to arsenic is not reduced by removing the spleen.

Kansas Society Medical Journal, Topeka

August, XVI, No. 8

60 Advantage of Transverse Incision in Appendicitis. J. D. Wilson, Emporia.—p. 221.
61 Malignant Tumors of Ovaries; Report of Cases. R. S. Haury, Newton.—p. 223.
62 Biennial Report of the Medical Department of Kansas State Penitentiary. P. B. Matz.—p. 227.
63 Valuable Treatment for Glaucoma. H. C. Markham, Parsons.—p. 234.

Kentucky Medical Journal, Bowling Green

August, XIV, No. 8

64 After Effects of Diphtheria on Eye, Ear, Nose and Throat. G. C. Hall, Louisville.—p. 407.
65 Modern Treatment of Diphtheria. J. I. Greenwell, New Haven.—p. 412.
66 Pathology of Glaucoma. W. D. Levi, Louisville.—p. 414.
67 Medical Treatment of Glaucoma. I. A. Lederman, Louisville.—p. 416.
68 Choice of Operations. A. O. Pfingst, Louisville.—p. 417.
69 Ophthalmia Neonatorum and Trachoma. J. G. Carpenter, Stanford.—p. 418.
70 Surgical Infections of Jaw. C. B. Spalding, Louisville.—p. 425.
71 Differential Diagnosis Between Chronic Cholecystitis, Duodenal Ulcer and Simulating Neuroses. M. Casper, Louisville.—p. 429.
72 Other Fellow's Mistakes. G. G. Thornton, Lebanon.—p. 432.
73 Plea for Better Diagnosis. C. L. Sherman, Millwood.—p. 437.
74 Modification of Ferguson's Operation for Excision of Upper Jaw. J. W. Price, Louisville.—p. 439.

Medical Record, New York

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75 Seborrheic Dermatitis. W. P. Cunningham, New York.—p. 353.
76 Is Infant Mortality an Index to Social Welfare? Scandinavia's Reply. K. C. Mead, Middletown, Conn.—p. 357.
77 Physician and Psychotherapy. S. E. Jelliffe, New York.—p. 362.
78 Medicine as Practiced by Chinese. W. W. Cadbury, Canton, China.—p. 364.
79 Treatment of Paralysis Agitans and Arthritis Deformans by Continuous Bath. S. Danzer, Brooklyn.—p. 367.
80 Proctitis. C. J. Drueck, Chicago.—p. 369.
81 Case of Laceration of Liver. C. A. Wayland and R. T. Wayland, San José, Calif.—p. 371.
82 Universal Immunization. H. B. Baruch, New York.—p. 372.
83 Fatal Case of Poliomyelitis in Adult. J. G. Smith, New York.—p. 373.

New Jersey Medical Society Journal, Orange

August, XIII, No. 8

84 Beriberi in Union County Jail. H. R. Livengood, Elizabeth.—p. 395.
85 Home Care vs. Institution Training for Blind Babies. D. E. English, Summit.—p. 398.
86 Case of Uterus Didelphys. W. P. Conaway, Atlantic City.—p. 400.
87 Case of Vesico-Uterovaginal Fistula and Rectovaginal Fistula. W. P. Conaway, Atlantic City.—p. 401.

New Mexico Medical Journal, Las Cruces

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88 Family Physician in Reference to Early Diagnosis of Tuberculosis. W. T. Murphey, Albuquerque.—p. 143.
89 Use of Pituitary Extract in Obstetrics. C. L. McClellan, Farwell, Texas.—p. 150.
90 Salvarsan in Treatment of Syphilis. C. F. Montgomery, Roswell.—p. 153.
91 Kidney Efficiency. H. A. Ingalls, Roswell.—p. 155.
92 Autobiography of Old Silk Hat. S. D. Swope, Deming.—p. 157.

New York Medical Journal

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93 Treatment of Acute Poliomyelitis. S. J. Meltzer, New York.—p. 337.
94 Autotherapy in Poliomyelitis. C. H. Duncan, New York.—p. 342.

95 Control of Epidemics. J. Manning, Saratoga Springs.—p. 343.
96 Evaluation of Paraphrenia. (To be concluded.) E. A. Strecker, Philadelphia.—p. 344.
97 Study of Drug Action. T. J. Mays, Philadelphia.—p. 349.
98 American Medicine of Eighteenth Century. G. W. Cook, Washington, D. C.—p. 351.
99 Roentgenotherapy in Chronic Arthritis. E. Zueblin, Baltimore.—p. 355.
100 Toluol; Its Value in Sterilization of Vaccines. L. D. Bristol, University, N. D.—p. 360.
101 Abnormal Labor. S. Wiener, New York.—p. 361.

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102 Substitute Feeding of Infants. J. P. C. Griffith, Philadelphia.—p. 385.
103 Physiologic and Toxic Actions of Formaldehyd. S. E. Earp, Indianapolis.—p. 391.
104 Fever, Part of Syndrome of Toxemia. F. M. Pottenger, Monrovia, Calif.—p. 392.
105 Typhoid. I. L. Nascher, New York.—p. 394.
106 General Practitioner. J. V. O'Connor, Woonsocket, R. I.—p. 398.
107 Evaluation of Paraphrenia. E. A. Strecker, Philadelphia.—p. 399.
108 Chronic Suppurative Otitis Media. H. B. Blackwell, New York.—p. 402.
109 Orthopedics of Hand; Report of Two Cases. L. G. Hanley, Buffalo.—p. 405.
110 Frost Bite in Hand Resembling Raynaud's Disease. N. S. Yawger, Philadelphia.—p. 406.
111 Value of Iodin in Gonorrhea. M. Abramovitz, Baltimore.—p. 407.

Ohio State Medical Journal, Columbus

August, XII, No. 9

112 Medical Practice — Past, Present and Future. G. H. Matson, Columbus.—p. 537.
113 Problem of Infection. S. M. McCurdy, Youngstown.—p. 543.
114 Use and Abuse of Forceps During Labor. W. Gillespie, Cincinnati.—p. 545.
115 Cesarean Section, Classical and Extraperitoneal. E. J. March, Canton.—p. 548.
116 Pubiotomy, Symphyseotomy and Perforation. G. B. Farnsworth, Cleveland.—p. 551.
117 Convulsions of Infancy and Early Childhood. E. G. Horton, Columbus.—p. 553.
118 Proctitis. C. E. Howard, Cincinnati.—p. 556.
119 Whooping Cough in Ohio. F. G. Boudreau, Columbus.—p. 557.
120 Applying Animated Drawing to Teaching of Surgical Technic. W. J. Brownlow, Cleveland.—p. 560.

Oklahoma State Medical Association Journal, Muskogee

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121 Early Cancer of the Stomach. A. W. White, Oklahoma City.—p. 225.
122 Carcinoma of Uterus. O. R. Gregg, Alva.—p. 231.
123 Surgeons' vs. General Practitioners' Viewpoint of Gastric Disturbances. R. Grosshart, Tulsa.—p. 235.
124 Gastric Ulcer Perforation Followed by Operation Twelve Hours Later and Recovery. F. S. Clinton, Tulsa.—p. 240.
125 Radical Treatment and Cure for Epididymitis, Acute, Subacute and Chronic. W. J. Wallace, Oklahoma City.—p. 242.
126 Second-Hand Surgery. W. W. Jackson, Vinita.—p. 243.
127 Acute Infective Osteomyelitis. J. J. Dial, Muskogee.—p. 245.
128 Mule in Intestinal Tract. C. W. Heitzman, Muskogee.—p. 248.

Southwest Journal of Medicine and Surgery, El Reno, Okla.

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129 What Are We Doing and What Should We Do for Feebleminded. W. L. Kendall, Enid.—p. 221.
130 Apoplexy. C. Von Wedel, Jr., Oklahoma City.—p. 229.
131 Surgical Symptomology of Right Upper Abdominal Quadrant. F. H. Clark, El Reno.—p. 238.
132 Mechanics of Human Body. C. B. Francisco, Kansas City, Mo.—p. 242.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

July, XIII, No. 151

1 Herpes Recurrens. H. G. Adamson.—p. 193.
2 Case of Ateleiosis. F. P. Weber and G. F. Stebbing.—p. 200.
3 Appendicitis Complicating Pneumonia. J. Allan.—p. 207.

Dublin Journal of Medical Science

August, CXLII, No. 536

4 Fractures and Fracture Dislocations. J. S. McArdle.—p. 73.
5 Clinical Report of Rotunda Hospital for One Year, November 1, 1914, to October 31, 1915. W. J. Smyly, R. D. Purefoy and E. H. Tweedy.—p. 79.
6 Diagnosis in Uveitis. E. Maxwell.—p. 94.

Edinburgh Medical Journal

August, XVII, No. 2

7 *Toxi-Infection of Central Nervous System. D. Orr and R. G. Rows.—p. 78.
8 *Four Cases of Acute Fatal Cirrhosis of Liver in Same Family; Suggested Relationship to Wilson's Progressive Degeneration of Lenticular Nucleus. B. Bramwell.—p. 90.

7. Toxi-Infection of Central Nervous System.—From clinical cases and the results of experiments Orr and Rows arrive at the following conclusions: (1) In spinal and cranial nerves there is an ascending lymph stream to the central nervous system, whose main current lies in the spaces of the perineural sheath. Toxins reach the spinal cord and brain by this route, and although they spread to some degree in the lymph spaces of the pia-arachnoid, and so may affect structures at a distance from the point of entrance, they pass for the most part in the main stream along the nerve roots into the substance of the central nervous system. (2) Outside the central axis the nerves are possibly protected by the vital action of their neurilemma sheath; most probably, however, it is the peripheral situation of the lymph current which is the deciding factor. The author holds that acute and chronic myelitic conditions are readily produced by infection of the ascending lymph system in nerves; that general paralysis of the insane is a chronic inflammatory disease of lymphogenous origin; to tabes dorsalis they assign the same lymphogenous genesis; that cases of acute meningomyelitis fall into the lymphogenous category, and there is now a preponderance of evidence to show that acute poliomyelitis must also be included in this group. There are many facts which show that infantile paralysis cannot be a blood infection, and indisputable evidence in favor of the lymphogenous genesis.

8. Familial Cirrhosis.—Four cases of acute fatal cirrhosis of the liver in the same family are reported by Bramwell, the patients being respectively 9, 10, 14, and 14 years of age. The disease was not due either to syphilis or to alcohol. The possible relationship of cases of familial cirrhosis of the liver and Wilson's progressive lenticular degeneration is suggested.

Indian Medical Gazette, Calcutta

July, LI, No. 7

9 Case of Pellagra. J. T. Calvert.—p. 241.
10 Iron and Arsenic as Cure for and Prophylactic Against Malaria. G. W. P. Dennys.—p. 242.
11 *Cheap Absorbent Dressing for Wounded: Incinerated Paddy Husk. W. A. Justice.—p. 246.
12 Purification of Water Supply of Lawrence Military Asylum, Sanawar, by Means of Bleaching Powder. M. A. Nicholson.—p. 248.
13 Abdominal and Bovine Tuberculosis in India. C. A. Sprawson.—p. 257.

11. Incinerated Paddy Husk.—Paddy (i. e., rice in the husk), is husked and then boiled at rice mills, the fuel used being paddy husk. This is not completely burnt and a large ash is left which Justice has called "incinerated paddyhusk." Incinerated paddy husk has a grayish black color and has the consistence of the rough siftings of tea. Envelopes or bags of cotton cloth are made. Two ounces of the paddy powder are filled into these envelopes, which are sewn up. The envelopes are tied up in brown paper in packets of six to a dozen, leaving the ends open. They are then placed in a steam sterilizer and subjected to a temperature of 120 C. for one hour. On removal from the sterilizer the ends of the packages are closed and sealed. The dressings are applied direct to the wound, care being taken that a sufficient number of bags, according to the size of the wound, are applied. A gauze bandage keeps them in position—so little effusion reaches the bandage that the bandages can be used again and again—this is important in military dressings. The dressings should be changed every twenty-four hours at least, but the ease with which they can be removed or replaced lends itself to more frequent renewals. It is a dressing as absorbent cottonwool. No leakage takes place till the whole is saturated. It is a powerful deodorant. The smell from the most offensive wounds is completely absorbed. It is a light dressing and is cool, a desideratum in tropical climates. The dressing is not injured by efficient sterilization.

Journal of Laryngology, Rhinology and Otology, London

July, XXXI, No. 7

14 *Atrophic Rhinitis (Ozena) and Tuberculosis. III.—The Pathologic Aspect. W. Wingrave.—p. 276.

15 Final Report on Isolation and Cultivation of Tubercle Bacillus from Discharging Ear in Cases of Chronic Purulent Otitis Media. G. H. Cocks and J. G. Dwyer, New York.—p. 288.

August, No. 8

16 Reports for Year 1915 from Ear and Throat Department of Royal Infirmary, Edinburgh. Part III. Stenosis of Larynx in Children Following Intubation and Tracheotomy. A. L. Turner.—p. 313.

17 The Past and Present of Otolaryngology. P. McBride.—p. 329.

14. Atrophic Rhinitis and Tuberculosis.—Wingrave found that a certain acid-fast bacillus is present in every case of true ozena (atrophic rhinitis) which is never found in any allied conditions. It possesses a close morphologic and tinctorial resemblance to the tubercle bacillus. The histologic changes resemble those of a tuberculous condition (lupus erythematosus). Animal inoculation produced lesions undistinguishable from tuberculosis. But there are two postulates which have not been conformed with, viz.: (*a*) Demonstration of the organism in the diseased tissues, (*b*) Production of the disease in an inoculated animal. With regard to the first, it is not alone in this deficiency, since other diseases share the same defect. As to the second, it is almost an insuperable difficulty in a guinea-pig, not only for anatomic reasons, but also for physiologic reasons. The disease in man is spread over a long period of years, and one can hardly expect a condition of such slow growth to be developed in the very short period of observation on the short life of the animal. So that some critical elasticity is demanded in this direction. Notwithstanding these weak links, Wingrave's investigation supports the view that atrophic rhinitis is a disease closely allied to tuberculosis, and that its subjects are purveyors and distributors of an organism which is probably a variety of the tubercle bacillus.

Journal of Tropical Medicine and Hygiene, London

August 1, XIX, No. 15

18 *Beriberi Puzzle: A Suggested Solution. W. M. McDonald.—p. 177.

18. Beriberi Puzzle: A Suggested Solution.—McDonald is of opinion that the volume of evidence is sufficient to warrant the assumption that improvement in housing and sleeping accommodation where large numbers of men live together, as in barracks, prisons, common lodging houses, mining kongis, ships, should be considered as a particularly important prophylactic measure in countries where beriberi is endemic or epidemic.

Lancet, London

August 12, II, No. 4850

19 *Treatment of Infected Suppurating War Wounds. R. Morison.—p. 268.

20 *An Anomaly in Widal Reaction. A. F. S. Sladden.—p. 272.

21 Effect of Typhoid Inoculation on Endemic Goiter at Lawrence Military Asylum, Sanawar, Punjab.—p. 275.

22 *Etiology of Epidemic Cerebrospinal Meningitis. M. F. H. Gamble.—p. 277.

23 Shiah Pilgrimage and Sanitary Defences of Mesopotamia and Turco-Persian Frontier. F. G. Clemow.—p. 289.

19. Treatment of Infected Suppurating War Wounds.—The steps of treatment advocated by Morison are: 1. Under an anesthetic, usually open ether, cover the wound with gauze wrung out of 1:20 phenol and clean the skin and the surrounding area with the same lotion. 2. Open the wound freely and, if possible, sufficiently to permit of inspection of its cavity. (In doing this special regard must be paid to nerve trunks and muscular branches of nerves, since the division of blood vessels, excepting the largest, and of the muscles themselves, does little harm as compared with that of the disability following nerve damage.) Cleanse the cavity with dry sterile gauze, mops, Volkmann's spoon, and remove all foreign bodies. 3. Mop the surrounding skin and the wound cavity with methylated spirit. Cottonwool mops conveying the spirit are used for this purpose, and are introduced on forceps. 4. Fill up the whole wound with the following paste: bismuth subnitrate, 1 ounce by weight; iodoform, 2 ounces by weight; with sufficient quantity of liquid paraffin to make a thick paste. Dress it with sterile gauze, and cover all with an absorbent pad, which is held in position by sticking plaster and a bandage. This dressing requires no change for days or weeks if the patient is free from pain or constitutional disturbance. Should, however, discharge come through, the stained part must be soaked in spirit and a gauze dressing, wrung out of the same, applied as a further covering. The advantages of this treatment have been most striking in cases of compound fractures of the long bones. Previously such compound fracture patients suffered so severely that their treatment had proved an ordeal for all concerned. Such cases now are associated with little more suffering and trouble than those of fracture without a wound at all. Redressing is very simply done. After removal of the old dressings the wound is covered with a dossil of wool soaked in spirit, and the sticky, dirty looking discharge is wiped off the surrounding skin until it is clean. This is done with dossils of cottonwool, soaked in spirits and applied by forceps. The wound and a small area of the surrounding skin are then plastered with paste, which in its turn is covered by a gauze dressing under a pad and bandage. In more than forty cases treated by this method, there has been no need to change a dressing sooner than intended. There has been, except in head wounds, no spread of septic infection, no cellulitis nor abscess formation, and no aggravation of constitutional disturbances after the operation. Relief of pain and fall of pulse and temperature when they were abnormal has been the invariable rule.

20. Anomaly in Widal Reaction.—In order to diminish the occurrence of this zone phenomenon as much as possible, the use of distilled water as diluting fluid instead of normal saline has been initiated by Sladden in his routine work. No practical objections to its use have been discovered, nor is the sharpness of the end point impaired. It is not claimed that the operation of the zone effect is thereby annulled, but that it is diminished and the agglutination test rendered distinctly more delicate without becoming any more complicated.

22. Etiology of Epidemic Cerebrospinal Meningitis.—It is Gamble's firm conviction that cerebrospinal meningitis in epidemic form is a true gonorrheal inflammation of the arachnoid membrane of the brain and spinal cord, set up by the bites of gonococcal infected pediculi corporis.

Bulletin de l'Académie de Médecine, Paris

July 25, LXXVI, No. 30, pp. 65-88

24 *Radiotherapy of Intra-Abdominal Neoplasms of Testicular Origin. A. Béclère.—p. 72.

25 *Autoserotherapy in Gonorrheal Orchitis. Wagon.—p. 81.

26 Serotherapy in Typhoid. Technic for Preparation of the Serum. A. Rodet.—p. 83.

27 Advantages of the Ass as Vaccine-Producer. (L'asino-vaccin et ses avantages.) Arnaud and Huon.—p. 85.

24. Radiotherapy Effectual for Tumors Originating in Testicles.—Béclère reports three cases which confirm the peculiar susceptibility of tumors of this class to radiant energy. The first case was the most strikingly successful of any he has ever encountered. A young man of 35 had an enormous tumor of the spleen three years after a retained testicle on that side had been removed on account of pain and epitheliomatous degeneration. The spleen had become involved in the course of time and had rapidly enlarged, without any signs of leukemia, but entailing extreme anemia and emaciation. The weight was only 60 kg., but the girth of the abdomen was 86 cm., the solid tumor reaching from the diaphragm to the groin and apparently filling the entire left half of the abdomen and encroaching on the right side. Under weekly Roentgen exposures of 4 H. units for each region, the tumor began to retrogress at once. In five months of the radiotherapy the 24 kg. he had lost were regained; no tumor could be palpated, and there has been no return of symptoms during the five years since. The young man has been serving as a cavalry officer through the war. The other cases showed marked improvement, permanent in one, but the other patient succumbed to metastasis. There is

no doubt, Béclère reiterates, that the cells of a testicle are exceptionally sensitive to radiotherapy, and tumors originating in them share this susceptibility.

25. **Autoserotherapy of Gonorrheal Orchitis.**—Wagon has only four cases to report, but the results were so good and so prompt that he thinks the method deserves more of a trial. He punctured the scrotum and injected 1 c.c. of the effusion aspirated from the scrotum into the subcutaneous tissue in the man's thigh.

Paris Médical

August 5, VI, No. 32, pp. 101-132

28 **An Automobile Surgical Ambulance.** R. Monod.—p. 101.
29 **Technic for Amputation from Standpoint of Prosthesis Later.** (L'amputation de Gritti au point de vue de la prothèse.) E. Mériel.—p. 107. (Moignons d'amputation du membre inférieur au point de vue de l'appareillage.) Judet.—p. 126.
30 **Drainage after Operations on Gastro-Intestinal Tract.** H. Chaput. —p. 112.
31 **Importance of Prompt Reeducation of the Elbow After Resection.** (Le rôle de la rééducation motrice dans la résection du coude.) Kouindjy.—p. 115.
32 **Combination of the Abbott and the Forbes Methods of Treating Scoliosis.** (Notre technique actuelle du traitement de la scoliose. Suppression du hamac, passage de feutres, fenêtres, etc.) J. Calvé.—p. 119.

Presse Médicale, Paris

July 27, XXIV, No. 42, pp. 329-336

33 **The Remote Results of War Wounds of the Chest.** (Les suites éloignées des blessures pleuro-pulmonaires par projectiles de guerre.) Denéchau.—p. 329.
34 **Technic for Tracheotomy in Adults.** H. Luc.—p. 330.
35 **Spring Device for Reduction of Fractured Jaw.** (Appareil pour la réduction médiate des fractures des maxillaires.) C. Blanc. —p. 331.
36 *Cholesterin Content of the Blood in Holland and in the East Indies. (Echanges cholestériniques et pathologie de la race.) C. D. de Langen.—p. 332.

36. Cholesterin as a Factor in Cholelithiasis.—De Langen's studies of the cholesterin content of the blood in Holland and in the Dutch East Indies have shown that there is a marked difference between Europeans and the natives of the Dutch Indies in this respect. In the latter the cholesterin content of the blood is only about half the European figure, while that of the bile is also extremely low. In Japan, the corresponding figures are said to be about midway between those in the Dutch Indies and in Holland. De Langen was led to this research by noticing the extreme rarity of gallstone trouble in the East Indies. When gallstones are found they are not the cholesterin stones of Europe, but are composed principally of calcium bilirubinate, thus resembling the *calculs hémolytiques* described by Chauffard. In a group of 5,800 sick natives of the islands there were only five cases of diabetes mellitus, while in a corresponding average group at the Groningen Hospital in Holland, the year before, he had found twenty-two diabetics among 1,200 patients. In Japan, also, glycosuria is very rare, and it is so mild that, as a recent Japanese writer has said, it does not deserve the name of diabetes. De Langen mentions further that the arterial pressure is low among the natives of the Dutch East Indies. He does not attempt to decide whether the physiologic hypocholesterinemia of the natives is the result of their diet or is a racial peculiarity nor whether this low cholesterin content of the blood has anything to do with beriberi.

Progrès Médical, Paris

July 20, XXXII, No. 14, pp. 117-128

37 *Syphilis as a Factor in Rheumatism; Sulphur and Mercury in Treatment. Loeper, Bergeron and Vahram.—p. 117.
38 **The Indemnity as a Factor in Traumatic Neuroses.** (La notion de consolidation dans les névroses traumatiques des sinistrés du travail et des blessés de guerre.) H. Verger.—p. 118.
39 **Bacteriologic Study of Kephir.** A. Sartory.—p. 122.
40 **Continuous Progressive Gentle Traction by Simple Means in Treatment of Stiff Joints and Muscular Contracture.** J. Regnault.—p. 123.

August 5, No. 15, pp. 129-136

41 *Staphylococcus Septicemic Meningitis. G. Etienne and A. Grosjean.—p. 129.
42 **Case of Gastric Cancer with Metastasis in Cerebellum and Terminal Meningitis.** D. De Fortunet and A. Cade.—p. 132.
43 **Reaction in Genital Organs to Vaccination Against Typhoid and Paratyphoid.** (Réactions orchi-épididymo-funiculaires consécutives à la vaccination antityphoidique et antiparatyphoidique.) A. Satre.—p. 134.

37. Syphilis as Factor in Rheumatism.—This article describes 41 cases of joint rheumatism developing in syphilitics and yielding as a rule to measures directed against the syphilis. Only one joint was affected in 3 cases, the trouble resembling ordinary white swelling. Several joints were involved in 8 cases. In 11 cases there was an arthritis without effusion, and in 10 the joint trouble was of the deforming rheumatism type. In 4 there was merely pain in the joint without deformity or nervous reaction. It seems plausible to assume that the rheumatism would not have developed in these young men if it had not been for the syphilitic soil. This assumption is confirmed by the benefit under mercury, especially when combined with sulphur.

41. Staphylococcus Meningitis.—The man of 46 had *Staphylococcus albus* septicemia, and was apparently on the way to recovery when secondary meningitis developed which soon proved fatal. The germ was in pure culture, and rabbits inoculated with it developed a similar septicemia.

Revue Médicale de la Suisse Romande, Geneva

July 20, XXXVI, No. 7, pp. 385-448

44 *Cerebrospinal Meningitis at Geneva. H. Mallet.—p. 385.
45 *Uterine Cancer and Radium. L. Aubert.—p. 401.
46 **Râles Propagated to Other Side of Chest as Source of Error in Ausculting the Tuberculous.** F. Heim and M. Jeanneret-Minkine.—p. 411.
47 **Acute Sensory and Motor Lumbar and Sacral Polyradiculitis Following Furunculosis.** Roehrich.—p. 422.
48 **Hydropyonephrosis from Supernumerary Artery.** C. Perrier.—p. 427.
49 **Nephrectomy for Hypernephroma.** C. Perrier.—p. 428.
50 **Fixation of Painful, Sagging Liver.** (Cas d'hépatopexie.) C. Perrier.—p. 430.
51 **Incision in Lumbar Region to Explore the Kidney Before Venturing to Remove Its Tuberculous Mate.** (Lombotomie exploratrice comme moyen de diagnostic dans un cas de tuberculose rénale.) C. Perrier.—p. 432.

44. Epidemic Cerebrospinal Meningitis.—Mallet recalls that the first description of this disease was published by Vieusseux of Geneva, Switzerland, in 1806. By a curious coincidence, there has been no epidemic there since until this year. Mallet reproduces the original description of 110 years ago; the disease was then entitled *fièvre cérébrale ataxique*. His analysis of the recent cases confirms the importance of healthy carriers in spreading the disease. He found only one carrier in the environment of his own cases, and he isolated this healthy person, and had him rinse out his nose repeatedly and take potassium chlorate internally. By the next day, no further meningococci could be found in the nasal secretions. In his fatal cases necropsy disclosed pneumonia in twelve and acute pericarditis in three. There were two cases of cerebral deafness among the survivors, and one case of mental disturbance during convalescence. The only certain sign is the discovery of the meningococcus in the cerebrospinal fluid on lumbar puncture. The mortality of the disease has been materially reduced by serotherapy. Its results are better the earlier it is started, the larger the doses, and the shorter the intervals. In infants, the disease is often difficult to differentiate and it is liable to assume a chronic form. If the foramen of Magendie becomes obstructed, the serum must be injected directly into the lateral ventricle.

45. Uterine Cancer and Radium.—Aubert agrees with those who regard radium as a useful palliative in inoperable cases and as an adjuvant to thorough surgical measures. Degrais insists that an inoperable cancer always derives some benefit from the radium exposures.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 29, XLVI, No. 31, pp. 961-992

52 *Acute Poliomyelitis in Switzerland. (Die Heine-Medin'sche Krankheit in der Schweiz mit bes. Berücksichtigung einer Epidemie im Kanton Luzern im Herbst, 1915.) J. Amdoussieur.—p. 961.
53 **A Fungus as Dressing Material.** (Die Anwendung einer Flechte—Bryopogon jubatus—als Verbandstoff.) B. Galli-Valerio.—p. 981.
54 **Fungoid Mycosis in Woman. Fatal in Three Years.** J. Weber. —p. 983.

August 5, No. 32, pp. 993-1024

55 *The Spirochete of Febrile Jaundice and Production of Antiserum. (Eine kurze Mitteilung über die Entdeckung des Erregers — Spirochaeta ictero-haemorrhagiae nov. sp. — der sogen. Weil'schen Krankheit in Japan und über die neueren Untersuchungen über die Krankheit.) R. Inada and others.—p. 993.

56 *Measurement of the Elasticity of the Arteries, and Its Clinical Importance. (Versuche über die elastische Kapazität der Arterien.) A. Bühler.—p. 1003.

52. Infantile Paralysis in Switzerland.—Androussieur reviews the history of acute anterior poliomyelitis, and reports a recent epidemic at Lucerne. The first case was in a woman of 32, the second in a man of 41 whose healthy wife had nursed the first case. The disease came on with sudden onset and high fever in both and simulated Landry's paralysis, proving fatal in six and four days. Eight other cases followed, all in children over 5. Some communication between the families was known in a number of the cases through healthy carriers, although they were in scattered farms. But in five cases no epidemiologic data could be discovered. The funeral of the first woman that died was largely attended and the fact that no more cases developed confirms Wickman's statements that the susceptibility to the disease is slight as a rule. The period of incubation was from two to seven days in all but two cases; in these it seemed to be thirteen days and five weeks. In three families two children were affected. In the seventy-nine cases at Zurich in the last twenty-five years the youngest patient was 4 weeks, the oldest 12 years old. Androussieur lists the various large epidemics on record, including Norway, 1905, 918 cases, and 1906, 334 cases; Sweden, 1906, 379; American, New York, 1907, 2,500; Massachusetts, 236; 1908, Massachusetts, 136; Australia, 1908, 135; Austria, 1908-1909, 1,393; Germany, 1909, 2,140; Nebraska, 1909, 200, and Paris, 1909, 100. In prophylaxis he urges strict isolation and disinfection at the bedside, with terminal disinfection. All in the environment should be watched and any with slight fever or sore throat should be isolated, especially children. Scrupulous cleanliness and ample ventilation should be enforced. All the persons in the house should gargle systematically and rinse out the nose and mouth with some disinfectant, such as 0.5 per cent. potassium permanganate, 0.5 per cent. dilute phenol solution, or neutral hydrogen dioxid. The children in the family should be kept at home for at least eight days and not be allowed to return to school unless they keep entirely well. The child that has had the disease should not be allowed to return to school until at least three weeks after definite recovery.

55. Spirochete of Febrile Jaundice in Japan.—Inada and his assistants give an illustrated description of the spirochete they have isolated from cases of the disease in Japan which presents the same clinical picture as that of Weil's disease in Europe. Patients were treated with serum from convalescents or an immune serum derived from immunized horses. The horse serum was given in twenty-six cases. After injection of 40 or 60 c.c. of the immune serum the spirochetes disappeared from the blood in twenty-four hours. One horse bore the subcutaneous injection of 800 c.c. of a virulent culture containing from twenty to thirty spirochetes in one field. A rabbit could be protected by injection of 0.01 c.c. of this horse serum against infection from 1 c.c. of a culture with 10 spirochetes to the field. Experiments were also made with goat serum. In clinical cases the spirochetes are not numerous in the blood, but if guinea-pigs are inoculated in the peritoneum with some of the blood, the spirochetes proliferate rapidly and induce a characteristic disease. They found that the spirochetes could penetrate the intact skin and can also cause the disease when swallowed. The spirochetes seem to live in stagnant water and damp ground and there does not seem to be any intermediary host. They are eliminated in the excreta, in the urine, mostly toward the end of the third week, but in some cases up to the sixtieth day.

56. Elasticity of the Arteries.—Bühler examined thirty-eight arteries from twenty cadavers, having devised an apparatus to measure the elasticity. The formulas and figures cited show the mathematical-physiologic laws regulating arteriosclerosis, etc.

Gazzetta degli Ospedali e delle Cliniche, Milan

July 30, XXXVII, No. 61, pp. 945-960

57 *Pulsation and Murmur to the Right of Umbilicus as Sign of Pancreas Lesion or Aneurysm of the Celiac Artery. (Su di un sintoma sconosciuto nelle lesioni del pancreas e nell'aneurisma del tronco celiaco.) G. Onano.—p. 948.

August 3, No. 62, pp. 961-976

58 *Improved Technic for Exclusion of the Pylorus. (Esclusione del piloro con introflessione della sierosa nel lume enterico.) G. Onano.—p. 965.

57. Differentiation of Pancreas and Gallstone Trouble.—Onano had a patient referred to him for operative removal of gallstones as the man was suffering from colics and jaundice. In palpating the liver and gallbladder he noted an abnormal pulsation and sensation of friction, with a murmur very distinct on auscultation, applying the stethoscope a fingerbreadth to the right of the umbilicus. These findings were peculiar and not to be detected in other patients with gallstones or in the healthy. This suggested that the pain and jaundice might be the result of compression of the common bile duct from some tumor, especially as there was no fever and hence acute inflammation could be excluded. At the same time the idea of a tumor did not harmonize with the periodical return of the colics about once a week, or with what seemed to be an enlarged gallbladder, which could be palpated under the edge of the large lobe of the liver. Roentgenoscopy was negative, but this might be explained by the gallstones being formed of cholesterin. The abdomen consequently was opened. The gallbladder was found normal and the trouble was found to be a large tumor in the pancreas. In a second similar case the compression inducing the recurring colics and jaundice was the work of an aneurysm in the celiac artery.

58. Exclusion of the Pylorus.—Onano utilizes the power of adhesion possessed by the peritoneum to exclude the pylorus. He has experimented with it on animals and found the results superior to other technics, while it seems to be simpler and takes less time, while no foreign body is left in the tissues. He makes a longitudinal incision, 5 or 6 cm. long, in the tract between the stomach and the duodenum, and turns in the walls so that the serous membranes of the two walls are brought into contact inside the intestine for a certain stretch. To promote formation of adhesions he abrades the visible mucosa that is accessible when the intestine is thus incised, and he takes a few stitches to bind together the introflexed serosa and press it against the abraded mucosa. The serosa beyond is sutured over the whole, and this in turn is protected by suturing a pedunculated wisp of omentum over it. Dogs operated on in this way, with a supplementary gastro-enterostomy, bore the operation perfectly and the new opening seems to functionate perfectly. None of the animals has been killed yet, but the exclusion of the pylorus seems complete.

Policlinico, Rome

July 30, XXIII, No. 31, pp. 943-966

59 Bullets Fired Base First? (Gli austriaci rovesciano anch'essi volutamente i proiettili di fucile nella cartuccia?) R. Alessandri.—p. 943.

60 A Field Hospital. (L'ospedaletto da campo da 50 letti.) T. Pontano.—p. 946.

July, Surgical Section No. 7, pp. 193-224

61 *Experimental and Clinical Study of Ligation of Coronary Arteries and Veins. (Legatura separata e simultanea delle arterie e delle vene coronarie del cuore.) L. Dominici.—p. 193. Concluded.

62 Fracture of the Tuberosity of the Tibia. (Contributo alla patogenesi della malattia di Schlatter-Osgood.) T. Costa.—p. 215.

63 Incision of Kidney Hilus to Extract Concretions. (Contributo alla chirurgia renale: pielotomia.) P. Amorosi.—p. 219.

64 Stab Wounds of the Kidney; Reimplantation of Severed Portion. G. Serafini.—p. 222. Continued.

61. Ligation of Coronary Arteries and Veins.—Dominici gives the details of forty-six experiments in this line on dogs. In six other dogs the effect of severing the vagus or paralyzing it with atropin was studied further. He has found in the literature eighteen cases in which coronary vessels had to be ligated in the course of operations. A branch of the artery was ligated in twenty instances and a vein once. He summarizes them all, including Bradbury's case published

in THE JOURNAL, 1913, lxi, 1809. One of the patients succumbed to his wound on the table, one died the next day and three within the week. The others left the hospital in good condition. One died from tuberculosis five years later, and one is known to be in good health after four years. Necropsy in two cases in which the severed descending branch of the coronary artery had been closed with a stitch showed that no harm had resulted, one of the men surviving for five years. On the other hand, in the two cases in which this artery was ligated, both patients died. Ligation of the ventricular collateral branches of the left coronary artery seems to do no harm; at most there results merely a focus of fatty infiltration. Ligation of other portions of the left coronary is always dangerous, but ligation of the great coronary vein seems to be harmless. Ligating at the same time the vein and the artery reduces materially the injury from ligation of the artery alone. This is probably due to extensive anastomoses. This assumption is confirmed by the survival for three hours of one dog after ligation of both coronaries and the great coronary vein. The injury from ligation of one of the coronary arteries is enhanced by the mechanical obstacle of the ligature, impeding the action of the myocardium. There is every reason to assume that the results of experiments on dogs can be applied in estimating the probable effect of such procedures on man.

Brasil-Medico, Rio de Janeiro

July 8, XXX, No. 28, pp. 217-224

65 *The Campaign Against Snake Poisoning in Brazil. (A lucta contra o ophidismo no Brazil.) J. Pinto.—p. 217.

66 *Primary Localization of Diphtheria in the Conjunctiva of Left Eyelids. (Caso de localisação primitiva da diphtheria na conjunctiva.) N. Da Rocha.—p. 219.

July 15, No. 29, pp. 225-232

67 Fecundation of Flagellate. (Fecundação n'um flagellado de vida livre "Prowazekia Cruzi"—Hartmann & Chagas.) C. Chagas and M. Torres.—p. 225.

68 Case of Actinomycosis; Tenth Recorded in Brazil. O. Torres. —p. 225.

65. **The Campaign Against Snake Poisoning in Brazil.**—Pinto relates that the state of S. Paulo in southern Brazil leads the world in its efforts to combat snake poisoning—ophidism. An institute was organized for the purpose of procuring antitoxins for the venom of snakes and their application in suitable cases. The antitoxins are supplied free and delivered also without charge to any point in the state reached by railroad. The number of ampules thus distributed has amounted to 5,000 a year in recent years. S. Paulo is the only state that keeps accurate records of its cobra bites, but estimating them for the whole country on the basis of its statistics shows that there must be on an average about 4,800 deaths from cobra bites and 19,200 accidents from this cause annually. Pinto urges the other states to organize relief stations where the antitoxin can be promptly administered and where venom can be taken from cobras and forwarded to the S. Paulo institute, which will return the equivalent in antitoxin. By this means, with very little expense each region could be equipped to combat cobra bites effectually. V. Brazil is in charge of the S. Paulo institute, and he has recently published a book, "Defense Against Ophidism," describing poisonous snakes in general and those of Brazil in particular, with colored plates, describing also the clinical picture which follows their bites and the means of prophylaxis. Chief among these are leather shoes and leggings, as 75 per cent. of all bites are in the legs. A bounty on cobras is also a useful measure, but only S. Paulo offers it. The mussurana, *Oxyrhopus cloelia*, destroys poisonous serpents, and it should be protected and its services utilized in this way. It seems to be peculiar to Brazil. [The dictionary defines "mussurana" as a kind of field mouse, but Oxyrhopus is the name of a family of snakes more or less poisonous, but not seriously harmful for man.] At the institute it has been found that the snake poisons of Brazil can be classified in four groups and a special antitoxin is prepared from native snakes for each group. From 10 to 20 c.c. of the antitoxins are injected at once and repeated in six hours, unless marked improvement is evident. Brazil now has records of 1,058 applications of the antitoxin. That prepared in France from the venom of serpents from British India is not effectual against Brazilian snake bites.

66. **Localization of Diphtheria on the Conjunctiva.**—Da Rocha's patient was a child of 2 whose left eyelids were swollen and hard, and the inner side was covered with false membranes, but there was no purulent secretion. The aspect suggested diphtheria, but no case was known in the region. Local instillation of antitoxin and injection of 10 c.c. were followed by the dropping off of the false membranes the next day, and the gradual subsidence to normal of the eyelids. The instillations were kept up and a second injection given. Nothing but staphylococci could be grown from the false membranes and the nasal secretions at this time, but two days later the condition grew worse again and diphtheria bacilli were then found in pure cultures. Antitoxin was then injected in small doses, 3 c.c. on alternate days, to ward off any tendency to anaphylaxis, and recovery was soon complete. The other eye kept normal throughout and the general health did not seem to suffer much.

Siglo Medico, Madrid

LXIII, No. 3268, pp. 481-496

69 The Nuclear Structure of Red Blood Corpuscles. (Investigaciones microscopicas acerca de la llamada estructura nuclear de los eritrocitos del hombre y de los mamiferos.) F. Mas y Magro. —p. 482. Continued.

70 Diarrhea in Children. (Tratamiento de las diarreas en los niños.) C. S. de los Terreros.—p. 489.

Prakticheskiy Vrach, Petrograd

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71 Case of Echinococcus Disease of the Liver Complicated with Ascites. (K kazuistik exinokokka petcheni, oslozhnennago vodyankoi.) V. M. Volkovitch.—p. 169.

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72 Myxedema in Two Children. B. I. Morgulis.—p. 183. Commenced in No. 20.

Russkiy Vrach, Petrograd

XV, No. 21, pp. 481-504

73 *Similar Organic Heart Defect in Six Children of One Family. (Slutchai semeinago rasprostraneniya serdetchnikh porokov.) N. E. Kusheff.—p. 481.

74 *Action of Camphor and Menthol on Coronary and Peripheral Vessels. (Dieistvie kamphori, borneola i mentola na vienetchnie i peripheritcheskie sosudi.) N. P. Likhatcheva.—p. 483.

75 *Experimental Appendicitis Induced by Way of the Blood. N. F. Mordvinkin.—p. 485.

76 *Suppurating War Wounds of the Knee. Z. I. Ponomareff.—p. 486. Commenced in No. 20.

77 Extension Walking Device for Fracture of Long Bones. N. A. Gurevitch.—p. 495.

78 Splint for Compound Fracture of Humerus. A. N. Abramova. —p. 497.

79 Poisoning with Methyl Alcohol and Its Detection in Alcoholic Beverages. N. N. Gromoff.—p. 498.

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80 *Asphyxiating Gases in Warfare. N. A. Kruglevsky.—p. 505.

81 *Grasping Movement as Pathologic Reflex. (O reflex akhvativaniya.) A. E. Yanishevsky.—p. 510.

82 *Action of Poisons on the Vessels in the Brain. (O dieistvie yadov na sosudi golovnogo mozga.) V. I. Berezin.—p. 513.

83 *Salvarsan and Similar Preparations Specific Treatment for Relapsing Fever. (Lietchenie vozvratnago typha salvarsanom, neosalvarsanom i arsenobenzolom Billon.) I. I. Iversen.—p. 518.

84 Action of Infantry Bullets. (O dieistvie ostrokonetchnoe malokalibernoe puli na russko-germano-austrieskikh frontakh.) G. V. Fovelin.—p. 520.

73. **Familial Heart Defect.**—There has been no postmortem in the family described, but six of the children presented an apparently identical syndrome and three of them have died suddenly. The three surviving show the same symptoms in various degrees. One child died young; the others all reached adult age.

74. **Action of Camphor and Menthol on Coronary and Peripheral Vessels.**—Likhatcheva found from her experiments on the ear and heart of rabbits that camphor, borneol and menthol dilate the coronary and peripheral blood vessels in dilutions of 1:2,500 and 1:5,000. Camphor is the weakest of the three. In dilutions a tenth weaker than this there is in the peripheral vessels first temporary constriction followed by gradual dilatation. The findings are tabulated for comparison.

75. **Experimental Appendicitis.**—Mordvinkin injected a culture of staphylococci directly into a vein in the ear of rabbits, after ligating the appendix or cutting it between two ligatures. The normal appendix proved able to eliminate the bacteria, thus reaching it in the blood, passing them on into the lumen of the intestines without harm if the appendix was permeable. If the appendix was obstructed, the staphylococci reaching it by way of the blood soon set up inflammation in it, with complicating peritonitis.

76. **Suppurating War Wounds of the Knee.**—Ponomareff decries any attempt to probe or drain the cavity of the knee joint when there is an infectious process in it or such is even suspected. He advocates absolute rest, immobilizing with plaster or splint. If the suppuration keeps up, however, he incises and drains the anterior half, following this by incising and draining the posterior half if this alone does not help. If nothing avails, excision of the joint or amputation of the femur must follow promptly if the infection shows a tendency to spread to adjacent regions.

80. **Asphyxiating Gases in Warfare.**—Kruglevsky analyzes the pathologic, pharmacologic and clinical facts observed and comes to the conclusion that the gases used in warfare at present are mainly chlorin and bromin.

81. **Grasping Reflex with Brain Tumors.**—Yanishevsky writes from Odessa to call attention to the way in which persons with brain tumors and other affections of the depths of the brain respond like very young infants by grasping any object that touches the fingers. He calls it the grasping reflex, and gives illustrations of the prompt way in which the fingers curl around a stick brought in contact with them, when otherwise the patient may be unable to flex the fingers. One patient with a tumor in the right frontal lobe and left paresis was unable to bend his fingers or open the hand voluntarily, but if a stick touched the volar side of the hand or the open hand was flicked with a towel, the object was grasped. Robinson and Preyer have studied the similar phenomenon in infants, and found it pronounced up to the age of 84 days. Yanishevsky noted this pathologic reflex in cases of spastic paralysis agitans, diffuse cerebral arteriosclerosis with diplegia and pseudobulbar phenomena, and in the last stages of paralytic dementia, but never in capsular or cortical brain affections. The reflex is particularly frequent and pronounced with tumors of the frontal lobe. In this region of the brain there must be normally some inhibiting center for the grasping reflex. The deeper a lesion in the brain, the more the reflexes resemble those in very young infants.

82. **Action of Poisons on the Vessels of the Brain.**—Berezin experimented with rabbits and large fish, pikes, finding that the cerebral vessels in both responded about the same to the action of various poisons. The alcohols dilate the vessels, the effect being most pronounced the higher the molecular weight of the alcohol. Various hypnotics, including chloral, also cause dilatation of the vessels in the brain. It was most pronounced with hedonal. Narcotics, such as ether, chloroform and acetone, also induce dilatation, weakest with the last mentioned. Dilatation was also produced by caffein, camphor, atropin, antipyrin, quinin and salicylic acid. The cerebral vessels also respond to vasoconstricting substances, such as epinephrin, but not as actively as the peripheral vessels. The latter are affected by even extremely dilute solutions to which the cerebral vessels scarcely respond. On the other hand, the action of the vasodilating substances is much more pronounced on the cerebral than on the peripheral vessels, and the cerebral vessels are also affected by such poisons as morphin, atropin, etc., which do not affect the vessels of other regions.

83. **Salvarsan Specific in Relapsing Fever.**—Iversen's experience has been that the spirochetes disappeared entirely from the blood in from four to eight hours after an intravenous injection of from 0.4 to 0.6 gm. salvarsan in 100 or 150 c.c. normal salt solution. The patients were discharged from the hospital in from five to eight days, while with other methods of treatment the hospital had to keep them a month or two. He adds that equally good results were obtained with similar preparations of other makes.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

August 5, II, No. 6, pp. 453-520

85 Influence of the Pitch of Sounds on the Reflex Response of the Membrana Tympani. (Over den invloed der toonshoogte van den geluidsprikkel op de uitkomst van den tensorreflex.) M. Ono.—p. 457.
86 Electrograms from Fragments of the Frog Myocardium. (Over eenige electrogrammen van kikkerhartspierfragmenten.) H. C. Rümke.—p. 462.
87 Mucilaginous Seeds as Laxatives. (Het zaad van Ocymum basilicum L.—selasih—en andere slijmerige zaden als laxeermiddel.) E. C. van Leersum.—p. 478.
88 Anomalies in the Structure of the Frontal Sinus. (Moeilijkheden door variaties en den anatomischen bouw der voorhoofdsholten.) A. de Kleyn.—p. 488.
89 Pseudo-Glaucoma. W. Koster.—p. 491.

Ugeskrift for Læger, Copenhagen

July 20, LXXVIII, No. 29, pp. 1197-1250

90 *Research on Occult Hemorrhages. (Undersøgelser over okkult Blødning. II. Kliniske Resultater ved Anvendelse af Benzidinproven.) J. P. Gregersen.—p. 1197. Concluded in No. 30.
91 *Etiology of Aortic Valvular Defect. (Etiologien til Aortaklappefejl uden samtidig anden Klappefejl.) G. Fløystrup.—p. 1214.

90. **Occult Bleeding.**—In this instalment of his report Gregersen reviews his clinical experience as compared with the findings of the tests for occult hemorrhages. Only one among 147 patients free from signs of ulceration in the alimentary canal gave a positive response to the tests for occult bleeding. This proportion of error of only 1:147 is a fine showing for any clinical test. In 18 other cases there was once one solitary positive reaction in a long series of negative responses but these 18 solitary reactions do not count among the nearly 1,300 negative findings in the stools. He found the benzidin test so delicate that it gave a positive response even after ingestion of 1 gm. blood by the mouth. The findings were constantly negative on applying the test to 135 specimens of feces from 18 patients with heart disease, and to 30 specimens from 4 patients with nephritis, and 51 specimens from 3 with cirrhosis of the liver. This group confirms the general experience that even with such congestion in the abdominal organs as accompanies these three affections, no blood finds its way into the lumen of the bowels. The findings were also negative in 35 specimens from 4 patients with pronounced gallstone trouble, but in a fifth case there was a faint positive response in 2 specimens while 23 were negative. This patient soon died from perforation of the wall of the common bile duct by a stone. A positive response thus in cholelithiasis may suggest ulceration and impending perforation.

His experience in 25 cases of chronic gastritis with achylia was also constantly negative; only one patient gave one faint positive response with 13 negative. The test was reliable also even when the outside of the lump of feces became coated with bloody mucus as it reached the lower part of the bowel. Applying the test to a scrap from the center of the lump gave a negative response in all but one of 102 examinations of stool from 11 patients with severe constipation plus colitis. His report on his 34 cases of gastric ulcer is not completed in this instalment although he mentions here that the tests for occult blood were instructively positive in 30 of the 34. The first instalment was summarized in these columns on page 84.

91. **Etiology of Isolated Aortic Valvular Trouble.**—Fløystrup analyzes here the necropsy findings in 42 cadavers with lesions of the aortic valve, the other valves apparently intact. It was evident, he says, that arteriosclerosis was responsible for the aortic trouble in 19 per cent. while there were signs of acute infectious endocarditis in 23.8 per cent. No causal factors could be incriminated in 60 per cent. of the pure insufficiency cases, while 80 per cent. of the pure stenosis cases were due to arteriosclerosis and 75 per cent. to syphilis in the mixed type. In 11.9 per cent. of the total 42 cases there was a history of acute articular rheumatism, and the age averaged about 38. In the arteriosclerosis cases the ages ranged from 56 to 83, while the syphilis patients were between 40 and 70 years old. Death followed not very long after the first symptoms of aortic trouble in most of the cases, but in one the interval had been ten years.